News updates, features, forums; www.computerworld.com=



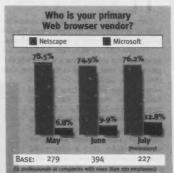
#### Market leader Netscape sees Microsoft in rearview mirror By Kim S. Nash and Gary H. Anthes

Netscape's plea for Department of Justice backup in its browser war against Microsoft could mean Netscape is running scared, some users and analysts said.

Indeed, Netscape Communications Corp. may have reason to be concerned.

An exclusive survey of information systems professionals by Computerworld, Inc.'s research division found that Microsoft Corp. is quickly gaining browser ground on its rival.

Twelve percent of respondents said Microsoft's Browser rouser, page 16



**Browser rouser** 

# Windows 95 may be just a passing fancy

By April Jacobs and Laura DiDio

On its first anniversary, the most hyped operating system in history has made itself a household name. But it's having a harder time convincing corporate America that it's a

Windows 95 is no slouch; Microsoft Corp. is expected to ship 45.7 million units this year. But analysts have recently downgraded their sales projections in light of Microsoft's message that Windows 95 is a pit stop on the way to Windows NT. NT 4.0 is shipping now.

"Some of these companies are coming back and saying, 'It's a stone I don't need to step on," said Chris

Windows 95's performance report card



Le Tocq, director of software research at Dataquest, a market research firm in San Jose, Calif.

Windows 95, page 14

#### Rmon phenomenon: Sales up, usage isn't

By Patrick Dryden

Few users seem to get full value from the Remote Monitoring tools they demand in their internetworking products.

Many administrators, fearful of performance problems or lacking Rmon experts on staff, never even try the Rmon agent software or modules embedded in their hubs, switches and routers.

Others, caught on the treadmill of reactive management, rely on Rmon in those devices only for troubleshooting.

"About 95% of organizations don't use all the network management they've bought inside these devices because they still spend all their time putting out fires," said Michael Howard, president of Infonetics Research, Inc. in San Jose, Calif.

Rmon phenomenon, page 115

HP's

Personal

Workstation

HP's NT workstations

Around \$5,000.

Remote

Monitoring

#### WHAT'S INSIDE

- Computer Associates will announce Windows NT versions of seven systems management products at CA-World '96 in New Orleans this week. See story, page 6, by Bob Francis.
- SAP AG will show users in Philadelphia this week how it plans to split its R/3 enterprise software into components. See story, page 8, by Julia
- The remote computing race heats up. See In Depth,



How IS can play a lead role in intranet deployment. See our pullout magazine, Computerworld Intranets, following page 32.



#### NT workstations nip at Unix heels

By Jaikumar Vijayan

er

First came the personal computer. Now comes the personal workstation.

ANN ARBOR MI 48103-1500

binger of a new class of computers, Hewlett-Packard Co. this week will announce powerful Windows NT workstations based on Intel

Corp.'s 180- and 200-MHz Pentium Pro chips. The systems target engineering,

mechanical design, three-dimensional animation and scientific applications markets and pack enough horsepower to give some low-end Unix boxes a run for their money, analysts said

"There's been this myth kicked around the industry that the only real workstations are Unix workstations. That's about to be challenged," said James Garden, an

NT workstations, page 115

include the following: 180/200-MHz Pentium Pro, 16M or 32M bytes of RAM, 1.6G-byte hard disk. Windows NT A.O. HP's Visualize graphics, multimedia and built-in networking. Starting price:

#BXBBJFT# \*\*\*\*\*\*\*\*\*\*\* CAR-RT SORT \*\* C035 #48103UIV300SR003\* JUL 96 001 010508\*\*\* UNIVERSITY MICROFILMS INT SERIAL PUBLICATIONS 300 N ZEEB RD

#### . Up Front

# Ready, set, 'net

ith Internet frenzy at a fever pitch, my brother is anxious to join the millions who surf the 'net and E-mail themselves silly. So Garry was delighted when a guy at his church offered to sell him a \$100 PC — an Intel 286. "What do I need to fix this thing up to surf the 'net?" he asked. A miracle, unfortunately.

Garry manages a carpet store in upstate New York, and like millions of other folks, he doesn't need Windows 95 or fancy applications. He just wants to cruise and schmooze online.

I thought of Garry when I entered a room full of network computers and 'net appliances at last week's SCO Forum, an annual gathering of Unix faithful in Santa Cruz, Calif. Among the 14

products on display was "On TV Consumer Internet Service" from ViewCall America in Norcross, Ga. (info@ viewcallamerica.com). The service offers Web browsing and E-mail capabilities via your TV for a onetime cost of about \$300, plus a monthly fee to a 'net service provider. Such a thing would have seemed peculiar last year, but what a difference 12 months has made. Last summer, the industry was in a tizzy over Windows 95 (see our story, page 1).



All those nightmares of Microsoft domination seem like no more than a touch of indigestion now. There was little angst among the 3,000 Unix vendors, resellers and IS managers in Santa Cruz last week. They were serene in the knowledge that their bets have long been placed on the open standards and protocols underlying the 'net. Those standards, with the addition of Sun's Java programming language and its write-once-run-on-many-platforms capabilities, will make the network computer a viable and economically compelling choice for many firms.

"The Internet is the biggest open system in the world," said SCO President Doug Michels, "and the network computer will carry the Internet to the desktop and into the living room."

I know how I'll judge whether Michels has it right or not: When Garry fires off that first E-mail message from the comfort of his own couch.

Maryfran Johnson, Executive editor Internet: maryfran\_johnson@cw.com

#### The 5th Wave by Rich Tennant



PES, I'M NORMALLY LARGER AND MORE AME-INSPIRING, BUT THIS IS ONLY A 4MB SYSTEM!"

## Fax tool kills the messenger

By Stewart Deck

Open Port Technology will deliver a product this week that eliminates one of the least high-tech processes in offices today — hand-delivering faxes.

Open Port AFD, an automatic fax distributor, is aimed at businesses that have a lot of incoming faxes that need to be processed quickly.

Open Port AFD electronically distributes faxes to individual data-entry queues where individuals process them in a first-in, first-out order. This eliminates the "sneakernet" method of manual fax delivery. Pricing for the sys-

tem starts at \$50,000. A large financial institution in the Midwest has signed up to use Open Port AFD to help handle the 30,000 to 40,000 pages of faxed credit and loan applications it receives each month.

#### 'Sneakernet' no more

According to the firm's vice president of administrative systems, the institution wanted to eliminate paper and the firm's exhausting "Nike network" of messengers who ran back and forth between fax machines and the data-entry center. The runners sometimes misdelivered and lost faxes or lingered too long around the water-

cooler with crucial faxes.

Especially attractive to the company is a feature that uses a split screen to place an image of the fax next to the data-entry form. The fax image slowly scrolls by at a specified pace.

"This [product] is a big step forward in fax technology, and the scrolling feature is the important key to this application," said Peter Davidson, a fax industry analyst at Davidson Consulting in Burbank. Calif.

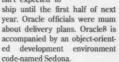
"A lot of companies are interested in automating the fax receiving process," Davidson said. "Until now, all of the pieces weren't in one place to do it."

#### News Shorts

#### Oracle8 goes into beta

Four years after starting development of a version of its database that blends relational and object technologies, **Oracle Corp.** is now finally starting

to beta-test
Oracle8. But
sources said
the software
isn't expected to



#### WAN tool kit ships

StonyBrook Software, Inc. in Bohemia, N.Y., this week plans to ship a suite of wide-area network management tools that run on a 32-bit Windows platform. Intra-Net Manager can discover, map and manage devices supported by Simple Network Management Protocol as well as frame-relay and Integrated Services Digital Network (ISDN) connections. It also collects and analyzes historical performance data. It costs \$1,995.

#### **Compaq cuts PC prices**

Compaq Computer Corp. in Houston last week dropped the price of its commercial desktop systems by up to 22%. The price of its outgoing ProLinea 5100 dropped from \$1,849 to \$1,439. Older-model Deskpros also took a whack; the price of a 133-MHz Intel Corp. Pentium-based system dropped from \$2,129 to \$1,799. The price of a 150-MHz Pentium system dropped from \$2,289 to \$2,094

#### **Dell preps servers**

Dell Computer Corp. in Austin, Texas, will introduce its first servers based on Intel Corp. Pentium Pro chips Sept. 9, sources close to the company said. The Power-Edge line will consist of entry-level and midrange servers with single- and dual-processor capabilities, sources said. Quad-processor systems will be announced later this year or early next year.

#### Informix targets Sybase

In the kick-'em-while-they'redown category, Informix Software, Inc. recently began to offer trade-in credits to customers who migrate from Sybase, Inc.'s SQL Server database to Informix' On-Line Dynamic Server. Informix is also offering a migration tool kit and consulting services to try to pry customers away from Sybase.

#### D&B adds Web tool

Dun & Bradstreet Software in Atlanta is developing a Java-based applet that lets users of its Smart-Stream human resources

system enter information and change

employee records from their desktops using browsers. D&B Software officials said the Web Series Employee applet is scheduled for beta testing later this year. General availability is slated for early next year.

#### **Gateway aids ISDN**

First Virtual Corp. this week will unveil a gateway that lets a large number of users share a few Integrated Services Digital Network (ISDN) lines for desktop videoconferencing. The V-Gate 3000 is a gateway between Asynchronous Transfer Mode (ATM) pipes and ISDN lines that basically removes the need to run expensive ISDN lines to each desktop. The gateway costs \$12,000 for either 25Mbit ATM or Primary Rate Interface connections.

#### IBM ships DB2 for SCO

IBM last week began to ship the distributed version of its DB2 relational database on SCO, Inc.'s OpenServer operating system. A five-user license costs \$1,595; additional licenses cost \$149 per user. IBM also said it will start beta shipments this month of an SCO version of its Net.Data data access tool for World Wide Web browsers. Net.Data, which already supports OS/2, AIX and Windows NT, can also be used to Web-enable applications.

SHORT TAKES The American Stock Exchange has introduced the Amex Options Display Book, a fully automated electronic system that was designed to replace the paper books used by options specialists. ... NetPro Computing, Inc. is shipping Version 2.0 of Server ScanMaster for Banyan Vines, antivirus software that scans electronic-mail message attachments in Banyan Systems, Inc. networks. It costs \$899 per server. ... Bay Networks, Inc. last week announced a lifetime warranty for its widely used Models 800, 2700, 2800 and 2900 series Token Ring, Ethernet and Fiber Distributed Data Interface hubs and its BayStack 10Base-T Ethernet Stackable Hubs.



#### LOOKING FOR A FASTER WAY TO LOAD YOUR DATABASE?

SyncSort UNIX can help you complete database loads, reorgs and reports in as little as half the time. SyncSort combines high-speed sorting, versatile data manipulation features and the ability to handle a

variety of data and file types. The result is a powerful, flexible tool for breaking database bottlenecks. To order SyncSort or for a free copy of our booklet, "Sorting and Relational Database Performance," please call or fax.

**syncsort** 

Tel (201) 930-8200 dept. 86CWS Fax (201) 930-8285 dept. 86CWS http://www.syncsort.com

°1995 Syncsort Incorporated

Inside Computerworld

#### NEWS

6 Big Blue objects IBM's Java-based framework aims at business applications.

A PUBLICATION OF

8 Fresh PowerBooks Apple will finally unveil new, more powerful laptops in November.

10 Easier than ISDN? Nascent ADSL networks may make remote access simpler and faster than ISDN.

16 Amdahl client/server Mainframe power unveils Pentium Pro servers and Windows NT-based software.

16 Navigator cracks up Netscape will split browser into semi-independent modules.

20 Hacking Justice Justice Department Web site gets unauthorized changes.

28 Junk E-mail Flood of E-mail "spam" clogs user in-boxes and hinders E-commerce.

32 CC:Mail gets upgrade Basic E-mail to get better management, Internet hooks and NT support.

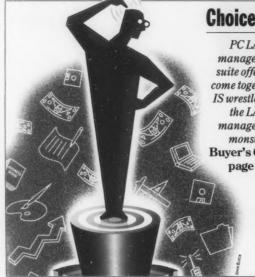
#### OPINION

36 Microsoft Exterminator A Microsoft attempt to kill Netscape would be stupid, Paul Gillin charges.

37 Online banking — not yet Despite hype, this generation isn't ready for online banking, M. Arthur Gillis warns.

37 High-hype economy Thornton May to pseudo experts: "Give us value or get thee gone.'





#### **Choice Cuts**

PCLAN management suite offerings come together as IS wrestles with the LAN management monster. Buyer's Guide. page 81

Easy does it: You don't have to play security cop to get users to keep data under lock and key. A little nudging goes a long way. Managing, page 74

#### **Technical Sections**

#### SERVERS & PCs

Review: High end at 133 MHz?

Gateway and Compag notebooks pack a lot in.

Unix scales DG, Unisys share multiprocessing technology.

#### SOFTWARE

Mac attack lags Mac users will have to wait another year for Microsoft Office.

Where in the world ... Mapping application includes connectivity. programming tools.

54 Notes applets Software makes Notes more flexible and Web-friendly.

#### THE ENTERPRISE NETWORK

57 More hyped than ATM? Gigabit Ethernet shows promise, but users are wary.

58 Co-opetition from IBM Standards approach sets IBM's Tivoli integration effort apart.

#### THEINTERNET

63 Quality service How to pick a reliable Internet service provider.

63 Webmastery 101 Webmaster certification courses are popping up every-

65 Web load balancing HydraWeb aims at multiserver Weh sites

#### CORPORATE STRATEGIES

**Check browsing** Banc One brings check imaging

to the Weh

#### **COME VISIT** OUR WEB SITE

#### QuickPoll: When is free not better?

When it's Internet server software. True lies? You tell us in this week's QuickPoll on what types of Internet sever software IS likes best.

www.computerworld.com

#### Forum: **Database to intranet.** database to intranet

Colette Coad, principal, Ernst & Young Center for Technology Enablement, goes online to answer your questions about how to link databases to intranets.

www.computerworld.com/forums/

www.computerworld.com

#### **Features**

#### MANAGING

74 Security issues

BUYER'S GUIDE

**BILLAN** management becomes suite spot.

#### IN DEPTH

90 Off and running The race is on: cable modems vs. telephone companies.

#### MARKETPLACE

105 Browsing for browsers Four questions to ask before you choose a Web browser.

92' New Web ways HBO's lames Altucher is pioneering a new type of Web developer

#### FINANCE & INVESTING

111 Angel endorsement Backing by single investors can save start-ups.

Company index	113
Editorial/Letters	36
How to contact CW	113
Inside Lines	118
Stock Ticker	112

# Developer/2000<sup>™</sup> Scores Highest in InfoWorld Product Comparison

The rigorous InfoWorld Product Comparison recently tested Oracle Developer/2000 and Microsoft Visual Basic to find which one "wouldn't crack under the pressure of scaling to the enterprise." After a battery of tests, InfoWorld concluded: "Our standout winner, Oracle Developer/2000…"



InfoWorld Product Comparison Score

**Enterprise Development Tools** 

InfoWorld on Scalability

InfoWorld on Team Development

InfoWorld on
Database Programming

InfoWorld on Reusability

InfoWorld on Productivity

Oracle Developer/2000



"Developer/2000 performance... convinced us that it was prepared to scale..."

"Developer/2000 leads the pack in datarepository-based development."

"Developer/2000 is packed with tools that make it the strongest... in transaction building."

"We were quite impressed with the wide range of object-reusability tools offered by Developer/2000."

"... Developer/2000 is packed... for productivity. Developer/2000's most notable tool... is its unique drag-anddrop application partitioning capability." Microsoft Visual Basic



"...Visual Basic just didn't have ... scalability."

"We feel this is an area where Visual Basic needs work."

"Visual Basic... transaction-building capabilities weren't ready for enterprisewide applications."

"...Visual Basic's object reusability features (are) inefficient and tedious."

"...Visual Basic... lacked the perks provided by Developer/2000."

For more information and a copy of the report, call Oracle at 1-800-633-1071, ext. 10051 or find us on the Web at http://www.oracle.com

ORACLE®

Enabling the Information Age The

# IBM foggy on San Francisco ship dates

By Sharon Gaudin SANJOSE, CALIF

IBM is building a series of object frameworks to give developers a common base for developing industry-specific applications.

The initiative, dubbed the San Francisco Project, was designed to offer an infrastructure for object-oriented applications in a distributed environment, explained John Slitz Jr., vice president of object technology marketing at the IBM Software Group.

Slitz said the frameworks, which are being written in Java, are still in development, and he couldn't say when they will be ready.

Ready or not, it's good news coming down the object pike, said John Strand, director of technology planning and integra tion at Sprint Corp. in Overland Park, Kan.

"At the business level, doing applications without having to deal with so much code directly would be useful," Strand said. "Any new way to enhance the development of object-oriented applications is welcome. The sooner we get there, though, the better."

IBM made the framework announcement here at Object World West last week.

A framework is a predefined architecture that contains a collection of several classes of objects. A developer can take a framework for a certain industry and simply add more specific objects to customize it.

The San Francisco Project would develop a standard base



IBM's announcement of object frameworks was a hit at Object World West

across different industries.

The frameworks are aimed at business applications such as general ledger, accounts payable and inventory control.

Karen Boucher, an analyst at The Standish Group International, Inc. in Dennis, Mass., said the initiative could be important if it actually produces useful architectures. She pointed out that there are already frameworks for different vertical applications, but there isn't a standard for those verticals

#### Nuts and bolts

"The hardest part of doing a framework is how the damn thing is architected," Boucher said. "How do you connect everything? How do you set it up? This would make that process easier because they don't have to create the architecture.

Barry Christian, president of International Business Systems (IBS) in Folsom, Calif., said a majority of time his people spend building object-oriented applications is focused on the nuts and bolts, which a standard framework would alleviate. IBS builds business applications.

"We spend a lot of time writing the exact same pieces of code. We'll take that code from this initiative and build on top of it the

elements that make us unique," said Christian. whose firm has been collaborating on the project with IBM and IBA International, an integrated business solutions provider.

IBM is working the initiative with approximately 50 other software vendors. Slitz said he is opening the door to other col-

#### Stakes high for objects

ompanies including IBM, Netscape Communications Corp. and Sun Microsystems, Inc. are betting heavily that object technology will nick up speed.

Sun and IBM announced at Object World West last week that they have joined forces to enable users to connect existing enterprise applications to the Internet and private intranets

"It's a world of multiple systems, and they've all got to talk to each other," said Steve Mills, general manager at IBM's Software Solutions division. "People don't want to worry about the plumbing. They want to know they can get connection."

IBM is licensing Sun's Joe,



Netscape's Marc Andreessen says content providers will become object developers

a Java-based client connectivity product. Joe, which was released earlier this year, was designed to let businesses deliver corporate applications to any platform that supports the Java programming

Sun will license class libraries, including IBM's MQSeries messaging system, which manages communications among applications that run in different environments.

IBM also is working on a version of its CICS transaction processing monitor for Sun's Solaris operating system.

And Netscape's co-founder, Marc Andreessen, threw his weight behind objects during a late-week keynote address in which he called object

technology the next wave to wash over the industry. He also announced that Netscape had joined the Object Management Group, a standards organization.

"Instead of being content providers, people will be object developers. The object marketplace will start up pretty quickly," Andreessen said. "This is going to have a pretty dramatic change on the way people produce applications." - Sharon Gaudin

### CA adds Windows NT support to Unicenter TNG

Add Computer Associates International, Inc. to the growing list of companies that believe Windows NT is a serious enterprise computing platform

At CA-World '96 this week in New Orleans, CA officials will announce Windows NT versions of seven systems management products, which will link to their mainframe counterparts, sources told Computerworld.

The new products (see box) will let users launch MVS or VMS systems management operations such as storage management - from Windows NT workstations or servers, or vice versa, the sources said. While some systems management products let users



manage on different platforms, CA's sweeping array of products is broader than other offerings.

The products are being betatested at some sites and will be available by year's end. CA officials declined to comment on unannounced products.

The ability to use systems management tools from a variety of platforms allows for management of distributed applications. Systems managers often must manage an application from both environments by using different tools.

The workstation versions of the company's CA-Unicenter: The Next Generation (TNG) are also a shot across the bow of the recent IBM/Tivoli Systems, Inc. merger

IBM has announced plans to integrate its mainframe systems management products with Tivoli's distributed systems management environment, but that may not happen until later next year when CA begins to ship its new

'There's still plenty for both CA and IBM to do in terms of distributed management. This is probably a step in the right direction,' said R. Paul Mason, an analyst at International Data Corp., a research group in Framingham.

Vendors are battling each other to see which can give users packages for managing distributed systems. But many users remain

We can see we'll need some

#### TNG'S NT GROUP

products CA is porting to the Windows NT environ-

- e CA-Schedule
- CA-StorageWS
- OCA-ACESWS
- CA-Top SecretWS

CA-Output Managem

sort of overall management environment down the road, but right now, it's not something we need," said Michael Tardif, vice president of enterprise technology at Goldman, Sachs & Co. in New York.

CA, in Islandia, N.Y., also will announce an Internet business unit at CA-World '96. The unit will provide World Wide Web hosting and development services for large corporations.

The unit also will focus on linking legacy applications and systems to Web-based applications, sources said.

The Internet business unit will delve into a new area for CA: small business. The traditionally enterprise-oriented company is developing a system to support Web sites that link a community of small businesses or organiza-

WHEN YOUR CENTURY-DATE-CHANGE PROBLEM BECOMES BIG ENOUGH, GIVE US A CALL.

#### **Get Started Today With Micro Focus Challenge 2000**

Now you can stop your century date change problem in its tracks. And there's only one set of tools that lets you do it yourself.

The Year 2000 Add-On is a trade

Micro Focus Revolve® and the Year 2000 Add-On™ provide all the tools you need to quickly and efficiently identify and fix your date problems across an entire systemall from within a single window on your PC. Then, you can compile and test changes back on the mainframe, or add the Year 2000 Compile and Test Option package to test those systems on the PC before sending them back up to your mainframe for production.

You can even choose to use Micro Focus' Challenge 2000 Consulting Services for project management expertise and expert training courses-all scaled to meet your individual needs.

You know us. As the 20-year leader in tools and services for developing and maintaining legacy systems, Micro Focus isn't about to let you get trampled by this oncoming problem. Let's head it off together right now. **Call Micro Focus and order Revolve** and the Year 2000 Add-On package today. It's the only solution you need. Call 1-800-632-6265 or visit us at http://www.microfocus.com.

Transforming Enterprise Systems MICRO FOCUS®

# SAP opens up R/3

#### Users will be able to mix and match components . . .

SAP AG's highly integrated R/3 enterprise software is disintegrating, and many users couldn't be happier.

As of December, the \$1.8 billion applications giant plans to sell R/3 as dozens of independent software components that users can mix and match with non-SAP software The honus is that most of the data integration for which R/3 is famous will remain intact, company officials said.

SAP will announce R/3's new Rusiness Framework to US users at its annual user conference this week in Philadelphia. The first products based on the design will ship in December as part of Version 3.1 of R/3.

SAP also will significantly expand the way users can access R/3. Under the new design's business application programming interfaces (BAPI), users will be able to reach the system via browser software, Microsoft Corp.'s Exchange mail system or JetForm Corp.'s electronic forms software.

BAPIs are SAP's new method for integrating third-party applications into R/3. SAP officials said the company will publish the specifications on its World Wide

Several users applauded SAP's modular approach and its more open stance toward third-party software vendors. Those vendors provide bolt-on applications such

as demand planning and transportation scheduling software. Previously, users had to develop their own interfaces between R/3 and legacy systems and other thirdnarty software

"Bolt-ons have become part of our SAP architecture. To the extent that SAP supports and endorses these [systems], it will make things less of a puzzle for in-

"This is a good thing because. in many cases, you don't need to do a full-blown upgrade to get to the areas where you want more functionality," said Andy Hafer, an R/3 user at Hydro Agri North America in Tampa, Fla.

"SAP has obviously been listening to users balking that one size doesn't fit all," said Jack Maynard, an analyst at Aberdeen Group. Inc. in Boston.

#### The cons

The downside could be greater systems complexity and higher systems management costs.

"It will be more work to piece together, and it's not going to be free. There will be additional costs," said one large R/3 user who requested anonymity.

Still, the user added, his company would be willing to pay more for a system that could more easily meet its shifting requirements.

Meanwhile, dozens of thirdparty vendors eager to ride the SAP wave are announcing R/3compatible products that will work with the new design.

Information Builders, Inc. in New York this week will announce a data warehouse package for R/3 users. Informix Software, Inc. will announce a business unit that works exclusively with SAP customers. Even Oracle Corp. a rival of SAP's on the client/server applications front - plans to announce a set of R/3 data warehousing tools (see story at right).

#### ... such as Oracle databases

By Craig Stedman

Oracle Corp. this week will announce a free tool kit aimed at making it easier to put SAP R/3 data into Oracle-based data ware-

The tool kit, which is being introduced at SAP AG's Sapphire user conference in Philadelphia, provides a graphical user interface into R/3's data repository. The code needed to extract data into a warehouse is automatically generated behind the scenes, eliminating the need to write custom programs using SAP's proprietary procedural language.

But there's a catch: Corporate customers initially will have to go to systems integrators and R/3 consultants to take advantage of the new software. For the time being. Oracle doesn't plan to make the Warehouse Toolkit for SAP directly available to end users.

#### One step at a time

"We're just trying to walk before we run here because it's a pretty complex thing to build a data warehouse," said Gail Ennis, senior marketing director for worldwide alliances at Oracle. "We want to make sure that it's done cor-

Bob Washa, SAP R/3 technical manager at Chevron Corp. in San Francisco, said Oracle's tool kit might reduce the need to use specialists to build data warehouses

But Oracle's reliance on integrators and consultants "is probably not the best partnership arrangement," Washa said. "We'd kind of like the tables to be turned so that we got the tool kit and a list of consultants who we could call if we needed help."

The limited distribution indicates that the tool kit "still needs some fine-tuning before it gets packaged up" for end users, said

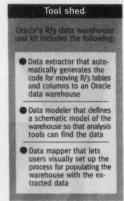
Clare Gillan, an analyst at International Data Corp. Mass.

Nonetheless. Gillan and other analysts said the Oracle tool kit should present a friendlier much face than what customers when they work directly with SAP's Advanced

Business Application Program language

Currently, programmers "sit there writing lines of code" to extract R/3 data for warehousing, said William Bell, managing director at Computer Sciences Corp.'s North American SAP consulting practice in Chicago, "Oracle's tools bypass all of that. You just select the items you want off of the screen."

Oracle is using SAP's traditional remote function call interfaces to R/3 but is evaluating SAP's new higher-level business application programming interface. Ennis



wouldn't say when the tool kit will support that

The tool kit which being built on top of Oracle's development Developer/2000 software, will go into beta testing in October and is expected to be ready for shipment by year's end. It supports Oracle7 databases.

#### Make it easy

of Oracle's database rivals,

will try to steal some of the

spotlight at Sapphire by an-

nouncing plans to support

Windows NT-based R/3 ap-

plications on its OnLine Dy-

namic Server by year's end.

Informix also is setting up

an SAP-oriented business

development unit.

Vendors such as Information Builders, Inc., Cognos, Inc. and Business Objects, Inc. are already shipping similar extraction and

analysis tools that mask the complexity of R/3. said Bobby Cameron, an analyst at Forrester search, Inc. in Cambridge, Mass.

But Oracle's dominant position in the database market is expected to give its tool kit obvious appeal customers. Cameron said.

#### R/3 readouts ADVANTAGES Faster to implement Easier to reconfigure as ■ Snap-together integration with non-SAP products DISADVANTAGES Greater systems complexity Potentially higher management costs

dividual implementers," said Tony Scott, director of information management and shared ser-

Splitting R/3 into components also will let users enhance systems on a part-by-part basis rather than replace an entire R/3 system each time there is a release

# Web site in the fourth quarter.

vices at Bristol-Myers Squibb Pharmaceutical Group in Prince-

> that it might be too little, too late. The PC lantons all have cool cutting-edge stuff in them, and they are coming out more quickly.'

Apple was expecting to rebound from its Power-Notebook

Book slump by teaming with IBM. The two companies announced a deal several months

ago whereby IBM was to release an IBM-branded PowerPC Think-Pad notebook running the Mac OS. That Mac-ThinkPad was slated to be delivered earlier this month at Macworld Expo in Boston. But IBM quietly opted to ship that machine only in the Japanese market and instead will take the wraps off a trimmed-down "Think-Book" at Comdex/Fail '96 in November, according to sources briefed on IBM's plans.

#### Apple in Epic battle for laptop sales

range from \$2,500 to \$3,700.

plug in new 603E processors that

run as fast as 167 MHz. Prices will

By Lisa Picarille

Attempting to regain its position as a leader in the laptop market, Apple Computer, Inc. is expected to unveil a new line of Power-Books in November.

The Epic line is expected to help defuse past quality problems that caused Apple to recall some PowerBook models. The recall, coupled with a battery problem more than a year ago, has contributed to Apple's falling from fourth to ninth place in laptop sales, according to preliminary secondquarter 1996 figures from International Data Corp., a research firm in Framingham, Mass.

The Epic family will be based on the 603E PowerPC processor. The standard Epic will run at 117 MHz, but users will be able to

The machines are also expected to include 12M or 16M bytes of RAM that can be easily

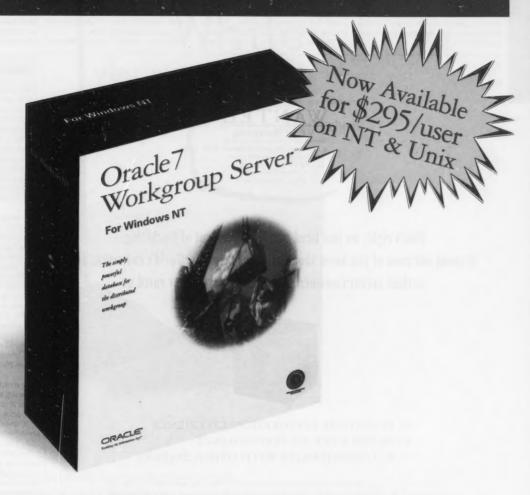
upgraded to 64M bytes. along with a 750M- or computers 1G-byte hard drive and a removable six-speed

CD-ROM drive, according to sources briefed by Apple.

These PowerBooks have been a long time coming, and I am very excited," said Russ Chapman, technical services manager at the Boston office of Jack Morton Products, a promotional service firm. "If you're a Mac site and you didn't want to move to a PC, it's been a real waiting game. Anything is better than nothing for Mac users. But the downside is

Competition Framingham. Informix Software, Inc., one

# Easy to Use. Easy to Install. Easy to Afford.



For just \$295\* a user you can get the industry's most popular database server—Oracle7 Workgroup Server. With point-and-click installation, you can bring the power of the world's leading database to your business—simply. And with single-point management you can easily administer both remote and local database servers—across any operating platform, including NT or Unix.

The Oracle 7 Workgroup Server. Easy to use. Easy to install. And easy to buy. Call Oracle at 1-800-633-0586, ext. 8137 today for more information. Or purchase directly from the Oracle Store at www.oracle.com/oraStore/welcome.html



# Baby Bells call in new data pipe technology

By Kim Girard

As several Baby Bells push forward with ADSL trials, more vendors are racing to unveil equipment that promises superfast data access for telecommuters and users in remote offices

Pacific Bell and GTE Corp. recently began Asymmetric Digital Subscriber Line (ADSL) trials in San Ramon, Calif., and Redmond, Wash., respectively. Other regional Bell operating companies (RBOC) promise ADSL in other areas by year's end.

"The real interest here is remote com-

munications for telecommuters and small branch offices using the Internet as a conduit for getting back to information at corporations," said Dan Merriman, director of remote communications at Giga Information Group in Cambridge, Mass.

ADSL uses regular copper telephone

receive data at speeds of between 1.5M bit/sec. and 6M bit/sec. ADSL which requires new modem technology, is 90 times faster than Integrated Services Digital Network (ISDN). The technology offers telecommuters connections at near-syn-

Digital does it

ADSLs squeeze mega-

bit speed from the

phone network. Instead of moving on the

public network, ADSL

traffic is switched to a

data network at the

phone company's cen-

tral office, which turns

twisted-pair phone

lines into digital pipes.

chronous speeds without having to make a huge investment fiber lines.

Gary Troutman, manager of corporate development at Georgia Institute of Technology in Atlanta, said he would welcome an alternative to the 28.8K bit/ sec. modem he uses for tele-

commuting. While his existing modem fails to provide a desired "subsecond response," ADSL speeds would provide "instant gratification," he said. "With a bigger data pipe, it would be better than I could imagine," he said. "Many people would want this capability at their house."

Joshua Turiel, director of information services at Adlife Marketing and Communications in Norwood, Mass., is also following the progress of ADSL. Turiel said he would consider using ADSL to link several client locations to the firm's main office.

"I'd run some ADSL to other client locations where it doesn't make sense to go to T1, and ISDN is too slow," he said.

#### Price cut expected

A limited number of ADSL products are available at about \$4,000 per modem pair. That price should drop to about \$500 by 1998, when a greater volume of products are expected to hit the consumer market, backed by a commitment from the carriers.

Analysts said ADSL development is accelerating as RBOCs gear up to compete with the cable industry, which is targeting its modems for use with broadband cable connections

Although 90% of U.S. homes are connected to cable networks, few businesses are. Also, cable technology was designed for one-way video traffic and requires multiple users to share bandwidth, which can affect speed. ADSL provides dedicated bandwidth for local access.

Gil Gordon, a consultant who specializes in telecommuting and virtual office issues at Gil Gordon Associates, Inc., said he is interested in cable and ADSL technology. But Gordon said he is worried that carriers will market it poorly just as they did with ISDN, which was deployed on a limited scale and at widely varying prices.

When you deploy a new technology ... you're deployed, or you're not," Gordon said. "The corporate customer who wants to set up 100 or 1,000 telecommuters with ISDN or ADSL wants to place the order and know they have it."



That's right, we just fired our Vice President of Marketing. It turns out none of you knew about us... but ComputerWorld's customers did. In their recent customer satisfaction survey, they rated us



#1 IN SYSTEMS INTEGRATION EXPERIENCE #1 IN PRICE VERSUS PERFORMANCE

#1 IN COMPATIBILITY WITH OTHER SYSTEMS

USConnect is a global network of leading systems integrators. When you work with USConnect, you enjoy the benefit of working with a local company that has the resources of a large international corporation. The only difference is, the decision-making capability is in the field-where it belongs. See for yourself why USConnect outranked the biggest names in the industry.



USConnect is proud to recognize its partners who have played such a large role in its success.





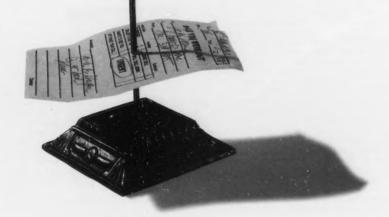






# While you were out:

your communications system called us, told us about a glitch and we fixed it.



Patented "EXPERT System" detects and repairs problems automatically (while you're working, meeting, fishing, etc.).

Works on multimedia communications systems (data and voice) like DEFINITY® Enterprise

Communications Server, and on your data network as well.

Lets you maximize uptime and focus on your business.

Can't get automatic remote diagnosis from other communications guys. Good reason to call: former Business Communications Systems division of AT&T, now Lucent Technologies.

#### Lucent Technologies

211 Mt. Airy Road Basking Ridge, NJ 07920 www.lucent.com/BusinessWorks 1 800 325-7466 ext. 954



We make the things that make communications work.™

# Sybase beefs up 'net offerings

#### Tools link Web sites to databases, apps

Sybase, Inc. last week unveiled NetImpact Studio, the first entry in its family of development tools and services designed to help corporate users create World Wide Web-based applications.

The drag-and-drop tool set which will run under Microsoft Corp.'s Windows 95 and Windows NT and enter beta testing later this year - was announced at Sybase's annual Powersoft user

#### **NetImpact Studio**

- Supports HTML 3.2, including cascading style sheets, tables
- · Connects to applications built using PowerBuilder and Optima++, Visual Basic, Delphi, lava and C++
- Supports Java applets, ActiveX controls and Netscape Navigator plug-ins
- · Connects to Web servers through Netscape API. Industry Standard API and Common Gateway Interface

Developers at the conference said NetImpact Studio looked useful for connecting Web sites to databases and applications.

"Right now, we have people who are just keying in the information for our Web page," said Douglas Joe, an analyst at the MTV Networks division of Viacom. Inc. in New York. "[Net-Impact| could help us out by putting program information up on the Internet directly."

"NetImpact Studio looks like a good growth path for PowerBuilder shops to move into," said Stephen Rasmussen, a consultant at Orkand Corp. in Atlanta.

The new tool set is a visual development system for connecting applications and components built with C++, Java, PowerBuilder and other development tools with Web-based applications. Along with a drag-and-drop environment, developers can also write code in JavaScript to connect databases with Web servers from Microsoft, Netscape Communications Corp. and other vendors.

#### **Unifying products**

NetImpact Studio will eventually be bundled with other Sybase products, and Sybase will roll out additional products under the NetImpact name later this year.

The Emeryville, Calif.-based firm hopes the NetImpact family of tools will help unify its product lines and divisions under a single umbrella, as it struggles against Oracle Corp., Informix Corp. and other database vendors, said Mitchell Kertzman, who became Sybase's CEO in July. Kertzman acknowledged that Sybase has grown by acquisition too quickly to integrate new units such as Powersoft, Micro Decisionware and Visual Components.

#### Mobile workers can view intranet data while off the network

**Mobile computing** 

The sequel

Version 5.5 of SQL Anywhere includes new

support for:

· Lotus and Internet E-mail

· Replication of binary large

Common remote

procedure calls with

Sybase's SQL Server

enterprise database

· Continuous background

backups while system is

protocols

By Craig Stedman

Sybase, Inc. is modernizing its SQL Anywhere mobile database with new tools that will let remote users browse portions of a corporate intranet while

Sybase last week announced plans to combine SQL Anywhere with a personal

World Wide Web server and tools for developing intranet-based applications. That lets SQL Anywhere

customers replicate parts of their intranets out to laptops used by mobile workers such as salespeople and insurance agents.

The employees can then browse through the intranet and process transactions against their local databases even though they are disconnected from the network. Changes are replicated back to the central database when users reconnect.

#### On the intranet

The personal Web server makes it look "just like you were on your intranet, even if you're not," said Jeff Browning, director of development at Cognitech Corp. in Atlanta, Cognitech, which sells SQL Anywhere-based sales force automation software, is betatesting Sybase's new Professional 5.5 release.

Stolt Parcel Tankers, Inc., a

database in some shipboard applications. But the in-

owning systems manager at Stolt.

Right now, each application "is a monumental undertaking," Shepard said. An intranet also could carry a wider variety of corporate information to make ship workers "feel more a part of the fold," he added. "As a shipping company, our employees are very, very remote?

> The intranet replication capabilities should help lower mobile connectivity costs because users have to be online only long enough for

the data to cross the wires, said Wayne Kernochan. an analyst at Aberdeen Group, Inc. in Boston.

However, bandwidth restrictions could pose a roadblock for some users, according to Kernochan and other analysts. Security is also a potential issue, and companies have to create business rules to reduce the ever-present danger that off-line

users will work with data that isn't

The Web server and intranet tools bundled with SQL Anywhere Professional 5.5 are part of the new NetImpact development suite built by Sybase's Powersoft Corp. tools unit (see related story at left). The package, which also includes Powersoft's InfoMaker query and reporting tool, is due to ship within 60 days for \$499 per user

SQL Anywhere competes with Oracle Corp.'s low-end databases and Microsoft Corp.'s SQL Server software for Windows NT. But SQL Anywhere's small footprint of under 1M byte of memory gives it an advantage for mobile uses, said

Herb Edelstein, president of database consultancy Two Crows Corp. in Potomac, Md.

As a workgroup database, SQL Anywhere is less

Houston-based cargo shipper, expects to use SQL Anywhere to extend upcoming intranet applications out to its ships as they sail on the high seas.

Stolt already uses the Sybase

tranet approach should provide a standard infrastructure that will make it feasible to replicate much more data to the fleet, said Jim Shepard, ship-

## Novell finally throws its intranet party

By Tim Ouellette

Novell, Inc.'s fashionably late entrance to the intranet gala last week may do little more than get users to turn their heads and take

The Provo, Utah, firm trotted out IntraNetWare, an intranet suite based around NetWare 4.11. Novell's next network operating system (see chart).

Observers saw strengths and weaknesses in the suite. Intranets can be considered glorified LANs - an area that Novell dominates - but Novell lacks the mind share of Netscape Communications Corp. or Microsoft Corp.

And NetWare is based on a different protocol - IPX - from the Internet Protocol, which is used over the Internet and on intranets.

"IntraNetWare is still an IPXbased product. [Novell is] forcefitting NetWare into the intranet space," said John Oltsik, an analyst at Forrester Research, Inc. in Cambridge, Mass. "Novell needs to offer a native IP version of Net-

#### What's included

IntraNetWare buyers will get Net-Ware 4.11, a World Wide Web server and browser, an IPX-to-IP gateway and a multiprotocol router for network connections. Novell has promised development tools at a later date.

The suite will ship next month simultaneously with NetWare 4.11. code-named Green River. Novell will flesh out pricing and technical details at the NetWorld/ Interop '96 conference to be held in Atlanta next month

In theory, the intranet game is Novell's to lose thanks to the company's huge base of 55 million NetWare users. But analysts and users also said the intranet game is almost over because many businesses have already turned to intranet and Internet products from Netscape or Microsoft.

For example, the National Board of Medical Examiners in Philadelphia, predominantly a NetWare shop, has turned elsewhere for intranet answers.

"I will look at [the NetWare Web Server] when NetWare 4.11 ships," said Steve Lopez, network manager at the medical testing board. "But I have already made my commitment" to Windows NT and related Web products, he said.

Novell wants users such as

#### Under the hood

Novell's IntraNetWare suite will contain the following pieces:

NetWare 4.11 (Green River) NetWare Web Server 2.5

(in beta testing) Netscape's Navigator Web browser

Multiprotocol router for Internet connections

IPX-to-IP gateway

GroupWise messaging and ManageWise manager packages can plug in, although sold separately

Lopez to be able to run Windows NT, NetWare and Unix Web servers in the same environment and manage everything with fewer utilities. So the company will port Novell Directory Services (NDS) to Windows NT by next year.

NDS on NT "would allow me to manage the NT server and administer the rest of my NetWare environment from one place. That is a big strength," said Scott Kunau, president of Certified Computer Services, Inc. in Cincinnati.

Although IntraNetWare is a catch-up product, "many Novell customers are still experimenting with intranets, and it is not too late to consider Novell," said Cindy Borovick, an analyst at International Data Corp. in Framingham, Mass.

Some users, after beta-testing NetWare Server 2.5, said they would consider Novell for intranets to get the benefits of the onestop management capabilities.

COMPUTERWORLD AUGUST 26, 1996 (www.computerworld.com)



Netscape Plug-ins and Web Server Objects. Get ready to launch dynamic business applications out on the World Wide Web with PowerBuilder 5.0.

Now you can use market-leading PowerBuilder® 5.0, together with Powersoft's new web.pb™ to build real-world applications that run on any Web server, access corporate data with our patented DataWindow™ technology, and generate HTML on the fly for your favorite Web browser.

What's more, PowerBuilder 5.0 lets you create applications that run as Netscape

Plug-ins for any Plug-in compatible browser. And since



Visit us at www.powersoft.com and you may win free products or other great prizes.

PowerBuilder 5.0 supports ActiveX controls, you can extend your applications' reach even further with new Internet components.

So "Web-ize" your applications today with PowerBuilder 5.0. It's available in three editions: Desktop, Professional,

and Enterprise. To explore it at one of our seminars or to get more information, call us at 1-800-395-3525. And get ready to send

your PowerBuilder applications

web.pb for Web Server Development

Window Plug-ins

DataWindow HTML Generation

ActiveX Support

Multi-Tier Application Partitioning

Compiled Code

Designed for Windows 95

ObjectCycle™ for Version Control

Native Database Drivers

Foundation Class Library

1996 Sybase, Inc. All rights reserved. Powersoft, PowerBuilder, web.pb. DataWindow, and ObjectCycle are trademarks of Sybase, Inc. or its subsidiaries.

All diher trademarks and registered trademarks are property of their respective owners, (508) 287-1502, http://www.powersoft.com

# Win 95 lands softly on desktops

On operating system's first-year anniversary, users say disruption of Win 95 has been minimal

By Bob Francis and Mindy Blodgett

A year after fears that Windows 95 would wreak havoc on corporate budgets to upgrade desktop hardware, the operating system that caused all the fuss barely rates a shoulder shrug.

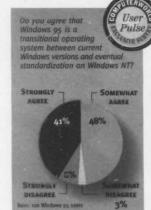
"We really haven't run into too many problems," said Robert Mayer, technical support manager at Cato Corp., a retail chain based in Charlotte, N.C. "We haven't seen much impact on our hardware buys because at the same time the operating system came along, system prices continued to fall, particularly the price of memory."

Windows 95's hardware requirements included a minimum of 8M bytes of RAM (16M bytes preferred), a Pentium processor and a recommended 850M-byte hard drive.

A year ago, those requirements added several hundred dollars to system costs. But all three items have declined rapidly in price over the past year, allowing users to meet or exceed those requirements for the same price.

For instance, a 200-MHz Pentium system with 8M bytes of RAM and a 1G- byte disk drive is available for less than \$2,000. That is about what a 100-MHz Pentium system with 4M bytes of RAM and a 500M-byte hard drive used to cost.

A Computerworld survey shows that 34% of companies that moved to Windows 95 spent less than \$350



per desktop on hardware, memory and disk storage

Yet Windows 95 has nevertheless kicked off many changes on the standard desktop PC and laptop, analysts and users said. "We have undergone a monolithic change across desktops and laptops because of Win 95," said Ken Dulaney, an analyst at Gartner Group, Inc. in San Jose, Calif. "It's changed the way we work, although the last year

has been one long beta test while Microsoft worked out the bugs.'

PC hardware vendors began bundling Windows 95 with their systems almost as soon as it became available from Microsoft Corp. Usually they included it with a dual-load option along with Windows 3.1.

Shortcomings

But Windows 95 hasn't lived up to all its promises. For instance, it was advertised as a plug-and-play operating system that would benefit mobile users. Supposedly, they could plug their laptops into docking stations with the pow er on and suffer no consequences feature called "hot docking." But it hasn't been as simple as it sounded.

With most laptops using Windows 95, the user must first turn off the system, a more time-consuming process.

"It's really more warm-docking than hot-docking," said Randal Giusto, an analvst at International Data Corp., a research group based in Framingham,

Most of the portable vendors have worked around the docking issue.

For portables, though, users may be left with Windows 95 as their lone choice. Windows NT lacks plug-andplay features such as hot-docking, although analysts said Microsoft is working on fixing that in the next release.

Still, many portable computers vendors plan to support NT Workstation on laptops and to preload it on their machines later this year.

Some users who have switched to Windows NT want to standardize on the operating system across the enterprise, including laptops, many laptop vendors

But analysts aren't sure that NT on laptops is a smart idea.

We think that NT is totally overhyped on the portable," Giusto said.

You can really only put NT on the laptops with the fastest chips and biggest hard drives. You can't put it on a laptop below 120 MHz, and so that leaves out corporations looking for value-priced laptops between \$2,500 and \$3,500," he said.

#### Win 95 may be just a passing fancy

CONTINUED FROM PAGE 1

Some users seem to agree with Le Tocg's assessment and are bypassing Windows 95 to move straight from

Windows 3.1 to Windows NT Workstation or are implementing mixed environments.

In a Computerworld survey, 24% of 108 information systems professionals polled said they skipped Windows 95 and went straight to Windows NT.

Bruce Smith, systems administrator at Logicon Communication Technology, Inc., a U.S. Department of Defense subcontractor in Arlington, Va., said he limiting his NT Workstation 4.0 upgrades to power users for now

"Microsoft has made no secret that NT Workstation is the

we're planning to keep our desktops leading-edge - you always have to feed

the hungry RAM monster," Smith said.

Briscoe Stephens, advanced scientific information systems coordinator at NASA's Marshall Space Flight Center in Huntsville, Ala., said his agency uses a

mixture of Windows 95 and NT Workstation

"There are a lot of low-end users whose PCs should be used as boat anchor, and those users are on Windows 95," Stephens said. "Our theory is if you have a larger machine, you might as well have the stability of NT Workstation.

Some users said the steadily declining price of system memory is sparking Windows NT Workstation sales.

"About 70% of our large customers are choosing NT Workstation over Windows 95. And overall among all customers, it's about a

long-term strategic desktop platform, so 50-50 split between the two operating systems," said Deric Scott, a systems engineer at Information Management

Systems, Inc. in Atlanta. But Scott said he expects that the pendulum will have overwhelmingly swung by year's end in favor of NT Workstation, which will account for 80% of IMS' operating system

Windows 95 can play a key role in making the transition to a 32-bit environment less painful.

"In most cases, if you're looking for the smoothest migration to 32-bit, then Windows 95 is the choice," said Michael Gartenberg, research director at Gartner Group, Inc. in Stamford, Conn.

#### Weighing costs

Frank Delargy, senior IS manager at Polaroid Corp. in Waltham, Mass., said

even though the company will likely eventually move to NT for higher-demand environments such as engineering and graphics, advantages such as built-in networking options and drivers made the company's initial switch to Windows 95 worthwhile.

"We've had nobody ask to go back [to Windows 3.1]," Delargy said.

Gartenberg said companies may also be considering the cost of moving to NT vs. Windows 95 and whether the benefits will make it worthwhile.

"Windows NT 4.0 has a better cost of

ownership but has a higher migration cost," Gartenberg said. He noted that the cost of migration to NT can be 30% more than a similar migration to Windows 95 when factors such as additional memory and installation requirements are considered.

Adam Taylor, group product manager

The future of

Windows 95:

Windows 97

or Cairo?

See our analysis

www.computerworld.

com/contents

for desktop and business systems at Microsoft, said with the release of Windows NT 4.0, companies can take advantage of the similar interfaces of Windows 95 and NT

Admitting that corporate adoption is slower than consumer adoption of Windows 95, Taylor said organizations "just work at a slower pace be-

cause it's a thornier issue getting it deployed. But we're very pleased with how it's being adopted."

William McGarry, director of IS architecture at Owens Corning Corp. in Toledo, Ohio, said he envisions an environment of mostly Windows 95 users, with NT being used for select implementations. McGarry said the company has already deployed 4,000 Windows 95 seats out of a total of 10,000

"NT for the vast majority of our users doesn't add any specific capabilities," he



NT doesn't add specific capabilities for most of our users. William McGarry.

Owens Corning

# Win 95 just one in bushel of woes at Apple

By Lisa Picarille

Despite the wishful thinking of Windows zealots, the release of Microsoft Corp.'s Windows 95 one year ago didn't cause Apple Computer, Inc. to sink in market share, suffer financially or collect reams of bad press clippings.

Apple managed all those things on its own.
"I think most of Apple's problems are self-inflicted," said Kevin Hause, an analyst at International Data Corp., a market research firm in Framingham, Mass. "Apple would still be in a relatively poor position even if Windows 95 never existed."

#### **Sinking shares**

Apple's market share sank to about 5% from 11% in the past 18 months, according to Dataquest, a market research firm in San Jose, Calif. That drop was due to poor product forecasting, delays in getting products to market and shrinking gross margins.

Dataquest predicts Mac OS-based systems will sell 5.4 million units this year, and Windows 95 sales will reach 45.7 million units. Windows 3.1 is expected to still be going strong at 20.9 million units.

But Windows 95 affected Apple by usurping the ease-of-use reputation on which Apple had relied for a decade.

Windows 3.1

Windows 3.1

Windows 95

Windows NT

OS/2

Windows NT

Windows NT

OS/2

Windows NT

Windows NT

OS/2

Windows NT

Other

OS/2

Source: International Data Corp., Framingham, Mass.

"Whether it is or isn't easy to use, Win 95 created the perception that it was as easy to use as Mac," Hause said. "This crippled Apple from falling back on that as a differentiator. That may have limited Apple's ability to grab entry-level users as quickly."

One user said Apple's inability to deliver

Hewlett-Packard Company Longs Drug Stores

Pharmacy Data Management

Seafirst Bankcard Services

Sara Lee Intimates

THE GOOD GUYS!

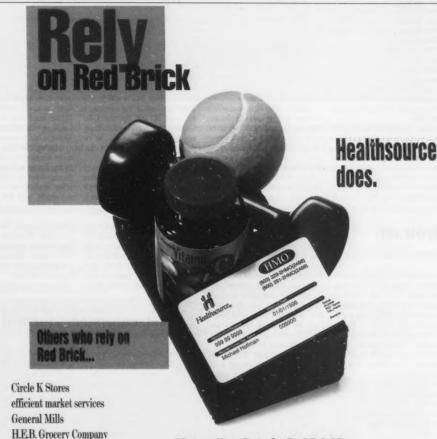
**Tufts Health Plan** 

Welborn Clinic

UCA&L

Copland, a major upgrade to its Mac OS, further hurt the Cupertino, Calif., firm.

"We were waiting for Copland to be able to hold off the onslaught of Windows throughout the entire company," said an information systems manager at a retail store who requested anonymity. "But Copland was delayed and then delayed again, and now it's not coming out as planned," the manager said. "We don't want to move to Windows 95, but we can't fight the operating systems battle with Mac technology. It's like using a slingshot when Microsoft is armed with Uzis."



#### Picture Your Data On Red Brick."

Healthsource, a national leader in providing and insuring health care, makes strategic business growth decisions using their Red Brick data warehouse.

"With Red Brick Warehouse, we can be more productive in business and clinical management, which enables us to provide innovative products and the highest quality care possible for our covered members," says Bob Chin, CIO.

Healthsource relies on Red Brick. Shouldn't you?



1 800 777 2585 • http://www.redbrick.com • Fax 1 408 399 3277

By Bob Francis and Mindy Blodgett

A year after fears that Windows 95 would wreak havoc on corporate budgets to upgrade desktop hardware, the operating system that caused all the fuss barely rates a shoulder shrug.

"We really haven't run into too many problems," said Robert Mayer, technical support manager at Cato Corp., a retail chain based in Charlotte, N.C. "We haven't seen much impact on our hardware buys because at the same time the operating system came along, system prices continued to fall, particularly the price of memory.'

Windows 95's hardware requirements included a minimum of 8M bytes of RAM (16M bytes preferred), a Pentium processor and a recommended 850M-byte hard drive.

A year ago, those requirements added several hundred dollars to system costs. But all three items have declined rapidly in price over the past year, allowing users to meet or exceed those requirements for the same price.

For instance, a 200-MHz Pentium system with 8M bytes of RAM and a 1G- byte disk drive is available for less than \$2,000. That is about what a 100-MHz Pentium system with 4M bytes of RAM and a 500M-byte hard drive used to cost.

A Computerworld survey shows that 34% of companies that moved to Windows 95 spent less than \$350

User Do you agree that Pulse Windows 95 is a transitional operatina system hetween current Windows versions and eventual standardization on Windows NT?



per desktop on hardware, memory and

Yet Windows 95 has nevertheless kicked off many changes on the standard desktop PC and laptop, analysts and users said. "We have undergone a monolithic change across desktops and laptops because of Win 95," said Ken Dulaney an analyst at Gartner Group Inc. in San Jose, Calif. "It's changed the way we work, although the last year has been one long beta test while Mi-

crosoft worked out the bugs. PC hardware vendors began bun

dling Windows 95 with their systems almost as soon as it became available from Microsoft Corp. Usually they included it with a dual-load option along with Windows 3.1.

Shortcomings

But Windows 95 hasn't lived up to all its promises. For instance, it was advertised as a plug-and-play operating system that would benefit mobile users. Supposedly, they could plug their laptops into docking stations with the power on and suffer no consequences feature called "hot docking." But it hasn't been as simple as it sounded.

With most laptops using Windows 95, the user must first turn off the system, a more time-consuming process.

"It's really more warm-docking than hot-docking," said Randal Giusto, an analvet at International Data Corp., a research group based in Framingham.

Most of the portable vendors have worked around the docking issue.

For portables, though, users may be left with Windows 95 as their lone choice. Windows NT lacks plug-andplay features such as hot-docking, although analysts said Microsoft is working on fixing that in the next release.

Still, many portable computers vendors plan to support NT Workstation on laptops and to preload it on their machines later this year.

Some users who have switched to Windows NT want to standardize on the operating system across the enterprise. including laptops, many laptop vendors

But analysts aren't sure that NT on laptops is a smart idea.

We think that NT is totally overhyped on the portable," Giusto said.

You can really only put NT on the laptops with the fastest chips and biggest hard drives. You can't put it on a laptop below 120 MHz, and so that leaves out corporations looking for value-priced laptops between \$2,500 and \$3,500," he said.

#### Win 95 may be just a passing fancy

CONTINUED FROM PAGE 1

Some users seem to agree with Le Tocq's assessment and are bypassing Windows 95 to move straight from

Windows 3.1 to Windows NT Workstation or are implementing mixed environments.

In a Computerworld survey, 24% of 108 information systems professionals polled said they skipped Windows 95 and went straight to Windows NT.

Bruce Smith, sys tems administrator at Logicon Communication Technology, Inc., a U.S. Department of Defense subcontractor in Arlington, Va., said he is limiting his NT Workstation 4.0 upgrades to power users - for now

"Microsoft has made no secret that NT Workstation is the

we're planning to keep our desktops leading-edge - you always have to feed

the hungry RAM monster," Smith said. Briscoe Stephens, advanced scientific

information systems coordinator at NASA's Marshall Space Flight Center in Huntsville, Ala., said his agency uses a

mixture of Windows 95 and NT Workstation.

"There are a lot of low-end users whose PCs should be used as a boat anchor, and those users are on Windows 95," Ste-"Our phens said. theory is if you have a larger machine, you might as well have the stability of NT Workstation."

Some users said the steadily declining price of system memory is sparking Windows NT Workstation sales.

"About 70% of our large customers are choosing NT Workstation over Windows 95. And overall among all customers, it's about a

long-term strategic desktop platform, so 50-50 split between the two operating systems," said Deric Scott, a systems engineer at Information Management

Systems, Inc. in Atlanta. But Scott said he expects that the pendulum will have overwhelmingly swung by year's end in favor of NT Workstation, which will account for 80% of IMS' operating system

Windows 95 can play a key role in making the transition to a 32-bit environment less painful.

The future of

Windows 95:

Windows 97

or Cairo?

online, at

www.computerworld.

com/contents

"In most cases, if you're looking for the smoothest migration to 32-bit, then Windows 95 is the choice," said Michael Gartenberg, research director at Gartner Group, Inc. in Stamford, Conn.

#### Weighing costs

Frank Delargy, senior IS manager at Polaroid Corp. in Waltham, Mass., said

even though the company will likely eventually move to NT for higher-demand environments such as engineering and graphics, advantages such as built-in networking options and drivers made the company's initial switch to Windows 95 worthwhile.

"We've had nobody ask to go back [to Windows 3.1]," Delargy said.

Gartenberg said companies may also be considering the cost of moving to NT vs. Windows 95 and whether the bene fits will make it worthwhile.

"Windows NT 4.0 has a better cost of

ownership but has a higher migration cost," Gartenberg said. He noted that the cost of migration to NT can be 30% more than a similar migration to Windows 95 when factors such as additional memory and installation requirements are considered

Adam Taylor, group product manager

for desktop and business systems at Microsoft, said with the release of Windows NT 4.0, companies can take advantage of the similar interfaces of Windows 95 and NT 4.0.

Admitting that corporate adoption is slower than consumer adoption of Windows 95, Taylor said organizations "just work at a slower pace be-

cause it's a thornier issue getting it deployed. But we're very pleased with how it's being adopted."

William McGarry, director of IS architecture at Owens Corning Corp. in Toledo, Ohio, said he envisions an environment of mostly Windows 95 users, with NT being used for select implementations. McGarry said the company has already deployed 4,000 Windows 95 seats out of a total of 10,000

"NT for the vast majority of our users doesn't add any specific capabilities," he



NT doesn't add specific capabilities for most of our users. William McGarry.

Owens Corning

## Win 95 just one in bushel of woes at Apple

By Lisa Picarille

Despite the wishful thinking of Windows zealots, the release of Microsoft Corp.'s Windows 95 one year ago didn't cause Apple Computer, Inc. to sink in market share, suffer financially or collect reams of bad press clippings.

Apple managed all those things on its own, "I think most of Apple's problems are self-inflicted," said Kevin Hause, an analyst at International Data Corp., a market research firm in Framingham, Mass. "Apple would still be in a relatively poor position

even if Windows 95 never existed.'

#### **Sinking shares**

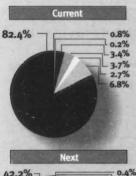
Apple's market share sank to about 5% from 11% in the past 18 months, according to Dataquest, a market research firm in San Jose, Calif. That drop was due to poor product forecasting, delays in getting products to market and shrinking gross margins.

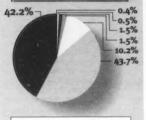
Dataquest predicts Mac OS-based systems will sell 5.4 million units this year, and Windows 95 sales will reach 45.7 million units. Windows 3.1 is expected to still be going strong at 20.9 million units.

But Windows 95 affected Apple by usurping the ease-of-use reputation on which Apple had relied for a decade.

#### Laptop leanings

Which operating system is on your portable and which do you plan to purchase for your next portable system?







Base: 300 medium-size and large sites from a January 1996 survey

Source: International Data Corp., Framingham, Mass

"Whether it is or isn't easy to use, Win 95 created the perception that it was as easy to use as Mac," Hause said. "This crippled Apple from falling back on that as a differentiator. That may have limited Apple's ability to grab entry-level users as quickly."

One user said Apple's inability to deliver

Copland, a major upgrade to its Mac OS, further hurt the Cupertino, Calif., firm.

"We were waiting for Copland to be able to hold off the onslaught of Windows throughout the entire company," said an information systems manager at a retail store who requested anonymity. "But Copland was delayed and then delayed again, and now it's not coming out as planned," the manager said. "We don't want to move to Windows 95, but we can't fight the operating systems battle with Mac technology. It's like using a slingshot when Microsoft is armed with Uzis."

Rely on Red Brick

Healthsource does.

Others who rely on Red Brick...

Circle K Stores efficient market services

General Mills
H.E.B. Grocery Company
Hewlett-Packard Company
Longs Drug Stores
Pharmacy Data Management
Sara Lee Intimates
Seafirst Bankcard Services

THE GOOD GUYS! Tufts Health Plan UCA&L

Welborn Clinic

#### Picture Your Data On Red Brick."

Healthsource, a national leader in providing and insuring health care, makes strategic business growth decisions using their Red Brick data warehouse.

"With Red Brick Warehouse, we can be more productive in business and clinical management, which enables us to provide innovative products and the highest quality care possible for our covered members," says. Bob Chin, CIO.

Healthsource relies on Red Brick. Shouldn't you?



RED BRICK®
The Data Warehouse Company™

1 800 777 2585 • http://www.redbrick.com • Fax 1 408 399 3277

# **Amdahl looks out from Windows NT**

### New products go on display today

By Michael Goldberg

Amdahl Corp. today will unveil four bundles of Windows NTbased hardware, software and services that are aimed at Internet, database, groupware and branch office applications.

The centerpiece of the packages is the EnVista server line, which features Pentium Pro processors from Intel Corp. and Microsoft Corp.'s Windows NT Server operating system [CW, May 6]. The packages will be available by Sept. 30.

Some bundles will include wellknown commodities such as Lotus Development Corp.'s Notes and Oracle Corp.'s Oracle? database. Amdahl also will provide its own technology for mainframe-to-Windows-NT server connectivity and for World Wide Web access to Amdahl will launch these Windows NT offerings using its EnVista servers

PRODUCT	Function	Price*
Branch Office Server	Includes centralized management system for 50 remote sites	\$1.5M
Database Server	Uses Oracle7 or Microsoft SQL; comes with 100G-byte LVS storage subsystem	\$295:000
Groupware Server	Uses Lotus Notes or Microsoft Exchange Server to support approximately 2,500 users	\$90,000
I-Net Server	Uses Microsoft Internet Information Server, gives Web access to mainframe and Unix databases through Amdahl gateway technology	\$77,000

\*Entry-level pricing, includes installation and consulting

server-based databases.

Amdahl will offer consulting services to help users implement the systems and build on its recent acquisitions of technology consulting firms DMR Group, Inc. and Trecom Business Systems, Inc. Amdahl projects that its shifting mix of products will mean 60% of its sales this year will come from software and consulting seriors software and consulting seriors.

vices. Package prices will depend on the application. For example, it will cost \$77,000 for the I-Net Server and \$1.5 million for a package to centrally manage 50 remote offices (see chart).

#### Change direction

Some mainframe shops familiar with Amdahl from its years of selling System/390-compatible hard-

ware have urged the Sunnyvale, Calif., company to branch out into lighter machines. Amdahl's first response was to resell Sun Microsystems, Inc.'s Solaris servers.

Offering EnVista is a good move because Amdahl can bring its familiarity with big data center management to less-costly frontoffice applications in the Microsoft world, said Jeff Biggs, Windows NT systems manager at Lexis-Nexis in Miamisburg, Ohio.

"We want them to move into directions like that (because) we want to see the cost of computing driven down. Amdahl's entry into the commodity market is encouraging because they understand the MVS environment" of IBM-compatible mainframes, Biggs said.

Jim Greene, an analyst at Summit Strategies, Inc. in Boston, said Amdahl's prepackaged approach to selling Windows NT servers indicates the vendor "is trying to get ahead of the curve. That [approach] is really going to characterize the market."

Like other vendors, Amdahl seeks to differentiate itself in the Windows NT arena with its data center expertise, Greene said. IBM, with its mainframe knowhow, could adopt a similar tactic. But the company so far hasn't chosen to emphasize a Windows NT strategy, he said.

#### **Browser**

CONTINUED FROM PAGE 1

Internet Explorer is their primary browser, while 76% of respondents said they use Netscape Navigator. But Internet Explorer has nearly doubled its standing in the past three months.

"Although Netscape has the [dominant browser] share right now, they could easily lose it to Microsoft," said Judy Cohen, director of the Internet

and electronic commerce laboratory at American Manage-

ment Systems, Inc. in Fairfax, Va.
"I can see Netscape's fear," Cohen said

Allegations that Microsoft uses anticompetitive moves to put its Internet Explorer browser on user desktops were laid out in an eight-page letter Netscape recently sent to the U.S. Department of Iustice

Microsoft's bundling of its Internet Explorer browser for free with Windows 95 and Windows NT operating systems is unfair, Netscape officials said. Netscape charges \$49 for single copies of its Navigator browser. Netscape also accused Microsoft of offering secret deals to computer makers to carry Internet Explorer.

Microsoft officials adamantly denied the charges and called Netscape's letter "a publicity stunt."

A spokesman for the Justice Department declined to comment on Netscape's letter or the department's planned action on it, if any. But he said an antitrust investigation of Microsoft is "ongoing."

Legal bluster aside, the vendor bickering has benefited users.

Upstart Netscape spurred Microsoft to build Internet products in the first place, and Microsoft's free software has helped some Netscape users cut better deals, said Ullas Naik, an analyst at First Albany Research in Boston.

One big company was able to get many copies of Navigator at \$3

**Web browsers** 

per copy, Naik said.

Mike Albert typifies the bottom-line
thinking some IS

managers have adopted.

Albert, chairman of a World Wide Web advisory board at Bechtel Group, Inc. in San Francisco, said if the rival browsers can do basically the same thing at the same speed, it's tough to ignore Microsoft's freebie.

"We have standardized on Netscape — today. But knowing that Microsoft will catch up, we constantly reevaluate," Albert said. "By the time you buy a copy [of Netscape's product] and support and buy the subscription, it's \$40 or \$50 a copy. We have roughly 10,000 desktops. What are we getting for \$500,000? Is it worth it?"

By getting users hooked on their browsers, Netscape and Microsoft hope to spark sales of more expensive, related software.

The whole browser brouhaha will likely have sputtered out by this time next year, analysts said.

Microsoft plans to include Internet Explorer functions in the Windows operating systems early next year. And Netscape plans to split Navigator into pieces that users can mix and match or plug in to other applications (see story,

below). To lobby the Justice Department, Netscape has hired Gary Reback, the same Palo Alto, Calif., lawyer who brought Intuit, Inc.'s losing antitrust case against Microsoft last year.

Joe Sims, an antitrust lawyer at

Jones, Day, Reavis & Pogue in Washington, said Netscape is all wet. Sims called the claim by Netscape — which dominates the browser market — that it is being treated unfairly by a company with a minority share "bizarre."

#### Netscape steers toward slimmer Navigator

etscape plans to split its Web browser into pieces to help soothe users who are frustrated with browsers' ever-increasing size.

Starting with Version 4.0 of Navigator, due by year's end, Netscape will make various parts of its browser available separately. The idea is to let users snap in only the modules they need, without having to buy the entire browser.

Slimmer browsers wouldn't require as much disk space and would save users money otherwise spent on extra space.

But the Mountain View, Calif., company isn't sure yet how the piecemeal plan will work.

One scenario would let users configure their own Navigator browsers and leave out, for example, Netscape's electronicmail module or newsreader if they don't want it.

Another more developmentoriented, option is to break up Navigator into even smaller

#### Going to pieces

Some of these prefabricated Web modules from Netscape won't be out until mid-1997

- · User interface, such as tool bars and sliders
- Security, support for Secure Sockets Layer and X.509 certificates
- E-mail, support for Internet Mail Access Protocol and Simple Mail Transfer Protocol
- Links to Open Database Connectivity drivers and relational databases

pieces. Modules would include particular features, such as Hypertext Markup Language support or user interface sliders and buttons, that could be inserted into Web and intranet applications.

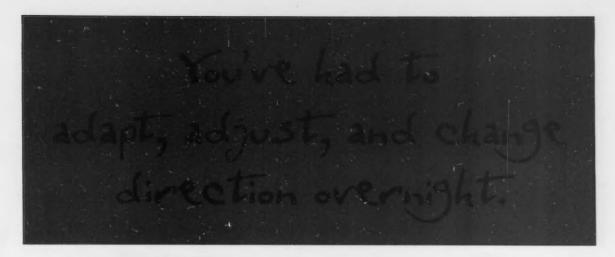
"We haven't decided for sure how we're doing this," said Roseann Siino, director of public relations at Netscape. But letting "people pick and choose what they need" is Netscape's goal, she said.

Snap-in components would give users a more flexible way to design Web applications, said John Robb, an analyst at Forrester Research, Inc. in Cambridge, Mass.

"You could customize what your users saw and how they interacted with intranets, rather than just using the stuff Netscape has built," Robb said.

Making modules could also help Netscape compete with Microsoft. The next version of Microsoft's Internet Explorer browser, due early next year, is expected to be integrated with the Windows 95 and Windows NT operating systems.

-Kim S. Nash



Mergers. Acquisitions. Reengineering. It's all part of doing business today. That's why the software you choose is important. Make sure it will help you adapt to change, not stand in your way.

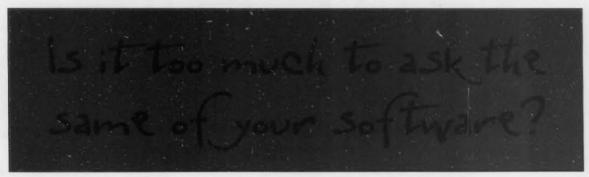
Some software is not designed for change. Its rigid structure can't be adjusted easily. Then there's PeopleSoft. PeopleSoft believes change is not only inevitable, but can also be an opportunity. That's why PeopleSoft designed its software to accommodate change quickly and easily.

Only PeopleSoft offers PeopleTools. With these unique software tools, modifying or reorganizing is just a matter of pointing and clicking. Change is easy because PeopleTools eliminate the need for detailed programming, armies of outside experts, or vast technical knowledge. All of which reduce your implementation and long-term maintenance costs.

And, unlike some software, PeopleSoft is portable, so you can change your database or hardware at any time.

If you believe in embracing change rather than avoiding it, perhaps PeopleSoft should be your software. You'll discover we have the technology, the people, and the commitment it takes to make that belief a reality. To find out more about PeopleSoft, give us a call at 800-947-7753 or visit





Enterprise client/server software for finance, materials management, distribution, manufacturing, and human resources.

A few of the companies managing change with PeopleSoft:

BARNETT BANKS CANON COMPUTER SYSTEMS, INC.

ELI LILLY AND COMPANY EQUITABLE LIFE

us at www.peoplesoft.com.

HERSHEY FOODS CORPORATION

SONY

WHIRLPOOL CORPORATION

HP Open Vers for Winews SNMP management platform, providing true, multivendor network management.



OPENVIEW



ADAPTER CARDS



MASS STORAGE



VECTRATECS



ADVANCESTACK HURS AND SWITCHES

k server than the

Te1



er management installation,

sprinted information form using cognicogy;

s,
uping.

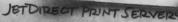
g
e
nent
nagecanner
ty by up

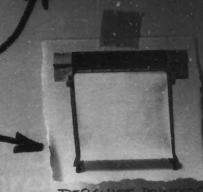
SCANNER

DE BACKARD









DESIGNIET PRINTER



hp. com/go/network\_city



NETWORK SUPPORT PACKS

#### RE: NETWORKING

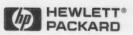
You think you know HP products. But how much do you really know?

The sheer mass and flexibility of our product line are there to keep your options open. Everything we do is designed for modularity, and designed well.

And our services and support help you keep your networking environment up and running.

Whatelse would you expect? We live and breathe network engineering.

For detailed specs, visit http://www.hp.com. Or call 1-800-533-1333, Ext. 1614.



# Attack highlights Web security risks

By Gary H. Anthes

The recent plunder of the U.S. Department of Justice's World Wide Web site by hackers highlights a new vulnerability for organizations getting on the Internet.

The exposure is especially great for com-

panies that allow unsophisticated end users to maintain Web servers.

Hackers defaced the Justice Department's home page Aug. 17 with antigovernment diatribes, a swastika, a nude photo and other graffiti. The intruder was apparently protesting the Computer Decency Act of 1996, which would criminalize the distribution of indecent material accessible by children on the Internet.

A spokesman for the agency said it wasn't known who had invaded the Web site (www.usdoj.gov) or how the break-in was accomplished. The Web site contains

#### To keep hackers off your Web site:

- Have a clear security policy, updated
- Have central coordination or control
- Protect Web servers behind firewalls
- Use security tools to check system configurations, detect intrusions and control and log network connections
- Dedicate a computer to Web service and eliminate all nonessential protocols, users, administrators and software
- Keep all confidential data off the public server

Source: National Institute of Standards and Technology,

speeches, news releases, biographies and other information about the department. and it gets about 160,000 accesses, or hits, per week, the spokesman said.

The first step toward protecting a Web server is to do a risk analysis, said Bob Bagwill, who runs the Computer Security Resource Clearinghouse Web server at the National Institute of Standards and Technology. "Obviously, if you don't put secret stuff on your Web server, it can't be lost if the system is compromised," he said.

But even public information should be protected from alteration, Bagwill said. That could be done by putting it on readonly optical discs, he said.

Bagwill said the public Web site should be isolated on a stand-alone computer, and unnecessary protocols and features should be disabled. "Machines are not that expensive; for \$2,000, it makes sense to have a sacrificial machine," he said.

#### Hackingin

A source at a major financial services firm said his company put its public Web server on the "untrusted side" of a firewall to ensure that confidential information on the other side couldn't be accessed. He said making the public site 100% secure probably isn't worth the resulting loss of convenience for rapid content deployment.

"Hacking into your public Web server is a little embarrassing, but it may not be of any great consequence," the source said.

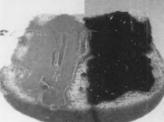
Robert Campbell, managing director at Peak Consulting in Woodbridge, Va., said the Justice Department's Web developers may have left bugs in the source code that allowed a hacker to gain access to executable code. That may have been done by guessing a privileged user's password or intercepting passwords on a communication line that isn't properly protected, he said.

Campbell said the hacker may have used that access to change the Web page contents or reroute incoming calls to a bogus directory containing the illicit Web content.

Terry Swack, a vice president of the Webmaster's Guild, Inc. in Cambridge, Mass., downplayed the security risks. Products such as Netscape Communications Corp.'s Secure Transaction Server and awareness by developers have minimized the risk for most organizations, she said.

# Can you imagine peanut butter vs. jelly?

lot of pairings are special because the results demonstrate synergy - the whole being greater than the sum of its parts.



implementations. That's why AIM's giving out both Windows NT and UNIX "Hot Iron" Awards at UNIX EXPO Plus this October 8-10, in New York.

Like Torville and Dean... Siskel and Ebert... The Internet and the World Wide Web.

And UNIX System and Microsoft Windows NT technologies.

Despite reports of an "OS War," many users and vendors are succeeding with both UNIX and Windows NT. The facts: each is great for certain tasks and environments, and the two together often spell synergy and greater success, for vendors, software developers and IS users and managers.

That's why AIM Technology, a division of Network General Corporation, the most respected provider of independent performance benchmarks, now offers test suites for both UNIX System and Windows NT And that's why Computerworld, "the newspaper of information systems management," is sponsoring these awards, which will be presented by Bill Gates of Microsoft for Windows NT and Alok Mohan of SCO for UNIX.

Because great technologies don't become truly great until they come together - like Windows NT and UNIX will at UNIX EXPO

#### **Enter Now!**

To enter your system into the AIM Technology Hot Iron Award competition for UNIX systems and Windows NT, please contact AIM, a division of Network General Corporation, at 800-848-8649. Email: benchinfo@aim.com, or visit our Web site at http://www.aim.com.









AIM TECHNOLOGY

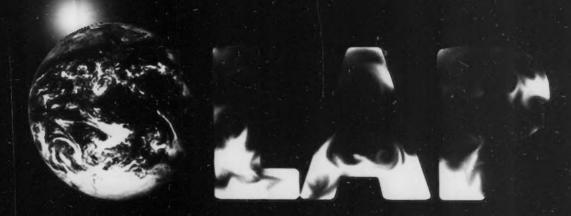
Everything you need to know

www.computerworld.com

All companies or product names are trademarks or registered trademarks of their respective hold

COMPUTERWORLD AUGUST 26, 1996 (www.computerworld.com)

Web certification programs are popping up. See page 63.



# Starting In October, Data Warehousing Enters a Whole New Dimension.

SAS Institute Introduces the First Integrated Data Warehouse and OLAP Solution.

Soon we'll launch the first multidimensional database that's tied directly to a complete end-to-end data warehousing solution...making data query faster and easier than ever. *Plus* reach-through options you can use to visualize your detail data. *Plus* new reporting objects you can apply directly to your database.

Our new multidimensional database is at the core of SAS Institute's OLAP solution—which includes the SAS® Data Warehouse for managing, organizing, and exploiting data...a full client/server environment... and a web enabler.

#### Yours FREE...A Guide to OLAP Success

Before you settle for an ordinary OLAP solution, see what's on the horizon in our free guide, *A Formula for OLAP Success*. Just give us a call at 919.677.8200 or send us E-mail at cw@sas.com



Phone 919.677.8200 Fax 919.677.4444 In Canada 1.800.363.8397

Visit us on the World Wide Web at http://www.sas.com//olap

# Ital Ho Interfac



Now, you can actually "lly" through your enterprise and fix problems without ever leaving your desk.

Imagine what it would be like to actually "fly" through your enterprise. To be able to find and even fix problems wherever they occur — without ever leaving your desk.

Sound incredible? It is. It's just one of many unique and innovative features of the new CA-Unicenter TNG.

CA-Unicenter TNG is the first open and independent software solution that covers all of your existing systems, networks, databases and applications. All your hardware. All your software All your IT resources.

CA-Unicenter TNG makes it easy. With innovative Business Process Views that let you view IT resources from a business perspective. It's the best way to transform IT information into intelligence.

Ince

GOMPUTER® ASSOCIATES Software superior by design.

Call 1-800-654-6118 For A Free TNG Video And To Register For A Seminar: Or Visit Us At http://www.cai.com

Call today to learn more about the single. integrated solution for End-to-End Management. It's the technology of tomorrow — that's available today.

AGH GAG

201994 Computer Associates International Inc. Islandia NY 11788-7000 All other product names referenced herein are trademarks of their respective companies

## Navigator 3.0 browser wins top marks

By Garrett N. Ray

For all the vendor vs. vendor bluster in the browser duel between Netscape Communications Corp. and Microsoft Corp., it's clear that the ongoing tussle is making a sterling Netscape product even better.

Navigator 3.0, released for general availability last week, is a well-tested, reliable and feature-rich World Wide Web browser that will sit happily on the desktop of virtually any Web user.

Navigator 3.0 has a substantial and most important - credible lead over Internet Explorer 3.0 [CW, Aug. 19] in terms of cross-platform support, adherence to Web standards and general reliability.

With regard to performance, Navigator 3.0 appears in most cases to be the more responsive of the two in delivering Web pages quickly and with little fuss.

This new version of Navigator, which has been widely available in seven beta-test versions since early this year, sports several enhancements over the 2.x versions.

Among the most important additions to Navigator 3.0 are new support for multi-

media and Internet telephony; enhancements to Web security: useful updates of the mail and news clients; up-

grades to Sun Microsystems, Inc.'s Java and JavaScript - including a just-in-time Java compiler for 32-bit versions of Navigator; and various Hypertext Markup Language (HTML) improvements.

For those who stuck with earlier versions of Navigator or with other Web browsers that support only HTML, the new multimedia extensions in Navigator 3.0 supplied as automatically installed plug-ins - will come as a surprise.



With new support for LiveAudio, Live-Video, QuickTime and Live3D, Navigator 3.0 supports virtually every important video and audio format available on the Web.

On the audio side, which requires a multimedia system with sound board, users won't need to find and install separate players for the musical instrumental digital interface, AU, AIFF or WAV files that often are embedded in Web pages. Java and Java-Script support haven't been significantly upgraded, but the new 32-bit, just-in-time complier speeds up the execution of Java applets on 32-bit operating systems.

Navigator 3.0 is a perfectly sensible browser for any user to install, trust and use. It is a solid browser, technically comprehensive and still considerate of Web etandarde

Ray is an Internet consultant and writer in North Conway, N.H.



Bridge the IT Gap

Toam application development with line-of-business groups



Revitalizing Application Delivery: Bridging to the Customer October 16-18, ANA Hotel, San Francisco

Too often application development is focused on either the technology or the business application. Bridging these two requirement sets is the primary challenge of today's IT professionals.

That's the topic of META Group's sixth annual Application Delivery Strategies conference, October 16 - 18 in San Francisco.

Here you'll have a chance to hear presentations from application development experts and participate in detailed discussions with ADS analysts and other IT professionals.

You'll also leave with in-depth conference notes, ensuring that you have an action plan to help your organization meet the development challenges

You'll learn how to introduce Internet-extended applications into your organization; build justification strategies for data warehousing, data mining, and DSS/OLAP; and plan for strategic and tactical integration of highvalue customer processes. And these are only a few of the topics covered during the information-

Build bridges don't burn them. Call us at 203-973-6785 to register or request more information. Register by September 16 packed three days! and save up to \$300!



Phone: 203 973 6785 Web site: www.metagroup.com

# From now on, if you can imagine it, you can manage it.



Informix Introduces
The First Truly
Universal Server.

Imagine this.

An infinitely scalable, multifunction relational database, that can be further enhanced by anyone, to do anything, with any kind of information. In other words, the INFORMIX-Universal Server.

Informix's unique DataBlade™ technology gives you the ability to manage any type of data, from text and numbers to sound, video, web pages — even time-series and geo-spatial data. And whatever else you need to unleash the power of business innovation.

Call **1-800-688-IFMX**, **ext. 81**, to get a copy of the Aberdeen Group's white paper. Or visit us on the web at **www.informix.com**, for examples of DataBlade technology in action.

Once you've seen Informix's Universal Server, it'll be hard to imagine managing without it.



© 1996 Informix Software. Inc. The following are worldwide trademarks of Informix Software. Inc. or its subsidiaries, registered in the United States as indicated by @ and in unnerrous other countries worldwide Informix, "Balablade" "I you can imagine it, you can manage it" is a service mark of Informix Software. Inc. All other company and product names may be trademarks of their respective owners: A FEW WORDS FROM KENT LANE, V.P. POST SALES OPERATIONS AT METRIX, ON WHY UNIFACE IS THE ANSWER FOR BUILDING BUSINESS-CRITICAL, 7x 24 CLIENT/SERVER APPLICATIONS.

FOR THE UNIFACE EUCCESS STORY SERIES, CALL US AT 1 800 365 3608, OR VISIT AT HTTP://www.compuware.com COMPUWARE.

operations running. To keep race we had to choose a robust, yet proven development environment that easily adapts to changing business requirements. So we chose UNIFACE Why? UNIFACE makes rapid deployment and maintenance across heterogeneous fechnologies easy. For enterprise-wide performance, development speed, and reliability, UNIFACE helps METRIX and our clients win." UNIFACE WHAT THE BIG GUYS USE

# CYBER JUNK

With E-mail, you can have way too much of a good thing

By Mitch Wagner

Users who make their E-mail addresses known in a lot of public places are finding that they are

making lots of new friends. Friends who want them to "Buy!" or "Invest!" or just "Make money!"

Is this the future of electronic commerce? A steady stream of annoving electronic mail that starts out with come-ons such as "The more times you post, the more money you could make!"?

Junk E-mail, often known as spam, is the detritus of the commercialization of the Internet. Yet unlike paper iunk mail, vou can't toss it in your briefcase, bring it home

and use it for kindling.

There is no measurement of how much spam gets out there, but experts say it is becoming more common as more log on to the Internet and online services

Spammers like E-mail because it is cheap. With an Internet connection, you can send as much Email as you want.

And while E-mail recipients can filter out some spam, most of it will get through (see story at right). You can't entirely cut off junk mail without also cutting off E-mail from your co-workers business partners and customers.

David Mattox, a database researcher at The Mitre Corp., tries to maintain a philosophical attitude about spam

"It's not all that big a deal when it comes right down to it. It's not something that ruins my productivity or anything," he said. "But it's just one more piece of crap that I don't want. It drives me up a

"We didn't get this E-mail capacity so we could get solicited," said John Samuel, an information systems manager at American Airlines. "I get the same annoyance at that kind of mail as I get when someone calls to sell me something when I'm trying to get

About the only thing users can do is keep spam in perspective and be quick on the delete key.

Spammers sniff out addresses using simple E-mail programs and use them to send out their sales pitches. The most common meth-

od is to capture a few thousand headers from Usenet newsgroups, use a search utility to find the line that starts out "From:" and add the addresses contained

But wait - THERES MORE MMMM

in that line to a mailing list.

Sometimes, spammers sell their address lists to one another and advertise those lists by sending out more spam.

Users unwittingly make themselves targets for spammers in a variety of ways, such as publishing their E-mail addresses on World Wide Web sites, registering with Web sites or signing un for mailing lists

Another common channel for spam is Usenet, the universal discussion forum propagated worldwide over the Internet.

Unfortunately, there is very little penalty for sending out spam. On occasion, spammers get barraged with Email flames in reply. And conscientious Internet service providers will throw spammers off their systems. Sometimes. spam recipients will send megabytes of Email in reply to cripple the spammer's system - a revenge known as mail-bombing. But in those cases the spammer can simply move on to another system.

"What's the worst thing that can happen to you? You lose your account. You get some nasty Email. That's not much," said Barry Shein, a spam fighter and president of Software Tool & Die, Inc. in Brookline Mass



For more tips on avoiding junk E-mail, go to www.computerworld.com/contents

#### Tips to avoid junk E-mail

ou can't block all junk E-mail from reaching you without throwing away some mail you actually want to read. But you can take measures to keep some of the junk posts away. Here are some suggestions:

• Keep a separate Internet account for cruising news groups, joining mailing lists and registering for Web sites. Keep your main E-mail address private, like an unlisted number.

The downside: This gives you one more mailbox to keep tabs on.

• Use the automated mail-sorting feature in many mail packages to presort E-mail from addresses of known spammers. You can also have it search for keywords such as "make money fast" and "moneymaking opportunity."

The downside: It'll be tough

to keep track of the keywords and spammers' E-mail addresses.

• Create a list of E-mail addresses that you want to receive mail from and have your software reject the rest. Screen out E-mail vou want

· Your company E-mail postmaster can block Internet mail from addresses known as sources of junk mail.

The downside: Same as blocking Internet addresses on an individual level.

• Finally, you can complain. If you get spam from a site, complain to the postmaster of that site. It's easy: If you get E-mail from somebody@somecompany.com, send your complaint to postmaster@somecompanv.com. "Postmaster" is a standard address used for the mail administrator at most sites.

- Mitch Wagner

# And speaking of Spam ...

Hormel makes client/server move

By Frank Haves

Hormel Foods Corp. is jumping from a pure mainframe environment to a three-tier client/server system over the next three to five years.

This is a big move for the maker of Spam and Dinty Moore stew. The \$3 billion company runs its mission-critical applications on IBM mainframes with IMS and DB2 databases. Hormel will re-engineer all its enterprise applications as distributed systems that use NatStar, a development and runtime system from

Nat Systems, Inc. in McLean,

But Hormel's move may also signal the start of a wholesale shift to newer technologies in the food industry, which has largely resisted moves off the mainframe. Only a few other food companies have made that jump in a major way. One is Campbell Soup Co. in Camden, N.J., which began a complete conversion of its legacy systems last year.



says food combanies need to be more efficient

"The foods industry needs to change its business practices to be more efficient, and this means we're all building new systems and making massive changes in existing systems," said Dan Darveaux, director of information systems at Hormel in Austin, Minn.

Similar shifts over the past several years have forced other industries to turn to client/server systems, but the food industry has dodged much of that pressure until now, said Bruce Bond, an analyst at Gartner Group, Inc. in Stamford, Conn

But the inflexibility of mainframe-based applications will force many companies to make a move over the next two years, he said.

For Hormel, the decision will put PCs on users' desks and enterprise applications on a network of servers, Darveaux said. The company over the past decade has bypassed software development technologies that range from computer-aided software engineering to visual development tools, deeming them not mature enough. Besides, the legacy systems kept Hormel profitable over the past

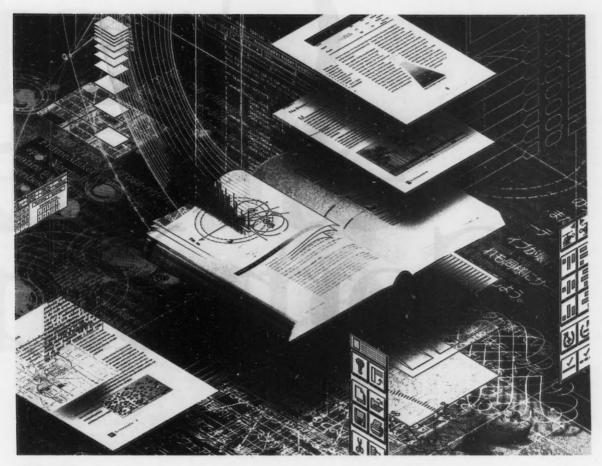
But the aging systems aren't flexible enough, "Our core systems are relatively old, and we want to make some maior investments in them." Darveaux said. He wouldn't disclose how much Hormel expects to spend on the systems.

Hormel will retrain between 30 and 50 IS staffers to develop and run the rewritten applications, he said. When the process is complete, all of Hormel's enterprise systems will have been migrated off the mainframe.



Hormel Foods is adopting a client/server environment

# ADOBE FRAMEMAKER 5 on WINDOWS 95 & NT. MAKES SHORT WORK OF LONG DOCUMENTS.





Adobe FrameMaker 5, the leading document publishing software, automates your time consuming authoring, formatting, and page layout tasks. And now its multi-platform support includes Windows 95

and NT. Adobe FrameMaker lets you easily create long documents like books with cross-references and indices. What's more, it's the perfect tool to distribute

Download a free HTML plug-in from www.adobe.com/special/hotamale

critical documents on the Internet and intranet, making it easier than ever to publish online product documentation, business proposals, engineering specs, training manuals and more. If you've got a big job on any platform, now you've got the power to meet the challenge. For more on Adobe FrameMaker 5, call 1-800-388-9883 extension 23703.

If you can dream it, you can do it." Adobe

m it, you can do it. Adobe

<sup>&</sup>quot;Also available on Windows 3.1, Macintosh", Power Macintosh", and UNIX: SunOS", Sun" Solaris", HP/UX, Digital UNIX', Silicon Graphics' IRIX', IBM" AIX'. Adobe, the Adobe logo, FrameMaker and the tagline, "If you can dream it, you can do it" are trademarks of Adobe Systems Incorporated. All other marks are the property of their respective companies. ©1996 Adobe Systems Incorporated. All rights reserved.

# Crea Int Commu

# te. egrate. nicate.

At Sybase, we provide the extensible software platform enabling you to use information technology to create innovative, flexible applications. Integrate new and existing systems.

And communicate throughout and beyond your organization.

Create. Integrate. Communicate.

Solve problems. Gain advantage. Make money.

Watch for upcoming success stories about Sybase customers and partners. And see how we're changing business.



1-800-8-SYBASE

www.sybase.com/create/

# **Computer Industry**

# Feds to abandon SQL compliance testing

Users worry that vendors will forsake standards

By Gary H. Anthes

he National Institute of Standards and Technology's (NIST) plan to discontinue its testing of SQL products for compliance with ANSI standards has left mixed reactions in its wake. Some SQL watchers were blase, but others expressed concern about a move to proprietary systems.

NIST, an agency of the U.S. Department of Commerce, for years has actively helped develop standards for data management software, including the SQL relational database language. It also develops tests for SQL standards compliance and tests and certifies products. Vendors pay NIST for the tests but not enough to fully cover the program's cost (see chart).

Without making a formal announcement. NIST has let standards groups know it won't develop test suites for advanced levels of SQL or for SQL enhancements. It also will discontinue the testing of SQL products, said Mark Skall, chief of software diagnostics and conformance testing at NIST in Gaithersburg, Md.

"But we are not going to get out of operational testing until someone in the industry is willing to take it over," he said. One candidate is the Institute of Electrical and Electronics Engineers, Inc.

In a study commissioned last year by NIST, TASC, Inc. in Arlington, Va., found that the agency's SQL program produced a whopping 41% "economic rate of return" on investment. As a result of the program, "society has realized increased market competition and a lower average price for SQL products," the consulting firm concluded.

The testing gives users a "comfort level," said Warren Capps, past president of the Mid-Atlantic Oracle Users Group. Possibly because of that comfort level, SQL vendors won't diverge from SQL standards any time soon, predicted Wayne Kernochan, vice president of commercial systems research at Aberdeen Group, Inc. in Boston.

Roger Sippl, a founder and past president of the X/Open SQL Access Group, agreed. He said the loss of the NIST certification program isn't serious because

any vendor that deviates from standards will be punished in the marketplace.

Still, Kernochan expects that over time vendors may put other criteria—for example, performance in handling multimedia queries—ahead of strict standards compliance.

Worry beads

Some users and vendor groups are concerned. "This is almost certainly going to result in a divergence of products in the marketplace, to the detriment of the user community and the market at large," said Don Deutsch, chairman of the American National Standards Insti-

tute's SQL committee and director of standards strategy at Sybase, Inc.

"I am concerned about NIST backing out of this business after having set a bunch of expectations in the marketplace," said James de Raeve, manager of testing at Open Group in Cambridge, England. "The net result is a test tool that ceases to be relevant after a period of time as the standard moves on."

The Administrative Office of the U.S. Courts in Washington has issued a request for bids for relational database management systems. It specifies that proposed products must be certified by NIST to comply with SQL standards.

"We've found the NIST test suites and certifi-

cation process very valuable in helping us sort through the products out there," said Steve Beckman, chief of the Application Development division at the Administration of the U.S. Courts. "If they didn't do it, we'd have to do it or pay someone to do it"

# Financial performance of NIST SQL conformance test program (Five-year average annual figures) Total cost \$282,000 Test suite \$76,000 revenue Net costs \$206,000 Economic \$2.9M benefits Source: TASC, Inc., Arlington, Va.

NIST pays off

#### Lotus accelerates CC:Mail development

By Tim Ouellette

Lotus Development Corp. is sending the message to users that basic electronic mail is here to stay

The Cambridge, Mass., firm next month will ship Version 7.0 of CC:Mail and plans to improve wide-area management tools for CC:Mail by year's end. On tap for next year are further full product upgrades, most significantly the addition of support for Internet messaging standards and tight integration with Microsoft Corp.'s Windows NT Server and group calendaring products.

Down the road, Lotus is also looking to add Java support to CC:Mail for the Web, a product that lets users access E-mail from a World Wide Web browser.

CC:Mail, with more than 10 million users, has long been the mainstay of Lotus' messaging strategy. But the improved messaging in Notes gives users a combination of E-mail and groupware and has many customers wondering about the future of CC:Mail [CW. March 3].

To allay these fears, CC:Mail 7.0 will offer a 32-bit client with full support for the Messaging Application Programming Interface standard.

A sea of CC:Mail

Lotus hopes the following changes to CC:Mail will help to double its base of so million users next year

- Add support for the Internet Mail Access Protocol and Lightweight Directory Access Protocol, along with Internet standards for calendaring and newsreaders
- Integrate better with Windows NT to compete with Microsoft Exchange
- Beef up wide-area management tools for CC:Mail by year's end
- Integrate the Organizer and CC:Mail data stores so both messages and scheduling information are in the same format
- Add the scheduling piece of the Organizer interface to CC:Mail

This lets the CC:Mail client access non-CC:Mail message stores such as Microsoft's Exchange Server.

Lotus' commitment is good news to

users who don't want to install a whole groupware infrastructure.

A recent survey of corporate information systems managers by UK-based research firm Xephon found that almost half have no groupware plans, and price is a major reason for this. CC:Mail costs \$55 per user, while Notes costs \$55 for each client and \$495 for the basic server. This doesn't include extra integration and programming costs associated with Notes installations.

And for those using groupware, E-mail applications still accounted for more than half of all groupware use.

Middle of the road

Lotus officials say the interest in groupware by vendors such as Novell, Inc., Microsoft and Netscape Communications Corp. has opened a middle ground for CC:Mail. Thus, Lotus' strategy is to focus CC:Mail at middletier and smaller accounts, said Larry Jones, CC:Mail's marketing director, while still catering to large companies that have traditionally run CC:Mail.

Hitachi Ltd. in Japan, which has the largest CC:Mail installation with 85,000 users, spent three months reviewing its messaging strategy before sticking with CC:Mail.

#### Briefs

#### **Bulens bolts from Lotus**

Don Bulens, former head of Lotus Develop-



ment Corp.'s 12,000-strong Business Partner program, has signed on as CEO of World Wide Web-based groupware maker Radnet, Inc. Notes' success has been largely due to the huge channel Bulens oversaw. Radnet, located just down the road from Lotus in Cambridge,

Mass., plans to develop a similar channel for its WebShare product.

Java fund raises \$100 million

Venture capital firm Kleiner Perkins Caulfield & Byers, a backer of Netscape Communications Corp., has created a \$100 million fund to invest in companies developing software and products for Java. The fund has already invested in several companies, including Active Software, Calico Technology, Inc. and Marimba, Inc.

CompuServe loses \$30 million

CompuServe Corp. has posted a fiscal firstquarter loss of \$29.6 million. First-quarter revenue grew by 12% to \$208.6 million, up from \$186.5 million. The company plans to cut 150 jobs. Volume 1 • Number 3 • August 26, 1996

# . COMPUTERWORLD Intranets

**PROJECTS** 



Lockheed Martin brings intranets to 70,000 global users. Annual savings from policies and procedures: \$600,000. Page 4

ADVICE



IS should own the intranet infrastructure but think twice about content management.
Page 4

EXPLAINER Our exclusive survey



Our exclusive survey finds IS taking a leadership role especially in intranet funding — but working closely with users. Page 6 ANALYSIS



Role Models
IS must lead,
not impede.



Story on page 2

ANALYSIS



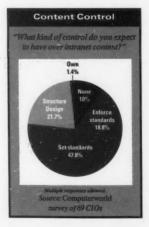
# Role Models

#### BY ROBERT L. SCHEIER

No more Rodney Dangerfield. Done right, intranets can boost respect for IS by making user jobs easier. But there's no single best role for technologists.

Smart approaches stress user enablement and build on IS expertise in the infrastructure of PCs, LANs and client/server. Losing roles: content provider, standards dictator.

Here are three good ways IS can lead — and one to avoid.



#### **Prophet**



Role: Stir the waters, teach users to fish.

Example: David Sarnoff Research Center in Princeton, N.J.

Corporate IS provides network backbone, development and publishing tools, and guidelines. User "information content providers" create new intranet-based applications.

"Our strategy is to make people want to use the intranet," says webmaster Joel Ruffin. "Instead of saying, 'We're the champions of this technology,' we say, 'What are your ideas? Let your mind run wild.'"

**Possible upsides:** Good rapport with users; big kudos for IS if low-cost intranets give competitive edge.

**Downside risks:** Choosing Web technology platforms that can't scale as business grows; hot seat if efforts fail to boost revenues.

#### **Team Player**



Role: Suit up with other functions to help set standards, develop

Example: Health Data

Sciences Corp.

IS sits on an eight-member committee that sets the San Bernardino, Calif., company's Web standards and development priorities. Other members are from marketing, product development and human resources. User departments control content.

An IS-developed intranet will serve

as a model for others in the company, says Greg Niemiec, manager of information services.

Upside potential: Good rapport and credibility with users. All sites get a uniform look and feel, thanks to standard Web page model. IS avoids extra headaches because departments control content.

Downside risk: In some organizations, committee management could break down when dealing with bigger, more complex intranets. Departmental intranets can clog networks. Who pays for infrastructure upgrade?

#### **Helping Hand**



Role: Support core Web technology, hand out best practices for content.

Example: Weyerhaeuser Co.

Corporate 1S takes technical charge of 4,000-user global intranet that provides information on company, customers, competitors and projects. It also sits on a cross-functional team that sets standards for Web technology and content management.

"We make it easy for people to do things in a productive and efficient way, as opposed to controlling or constraining what they do. We encourage the development of [content] standards," says John Anderson, director of technology assessment and planning. "But those aren't IS standards."

Weyerhaeuser splits intranet management roles by classifying content as either "official" or "unofficial." Official content is posted on the companywide server, contains links to other sites within the company and must meet corporate look-and-feel guidelines. Unofficial content appears only on a departmental server and is subject to only departmental review.

Upside potential: IS is seen as an enabler of, not an impediment to, business goals. Empowered, innovative users. IS shares in credit for big boosts in companywide coordination and communications.

Downside risk: Increased IS work-

load if departments refuse to pay for increased support and training. Also, decentralized development can cause headaches with incompatible Web servers and database access middleware.

#### Avoid! Ignored Parent



Role: Slow disciplinarian. Example: Symix Sys-

tems, Inc., a manufacturing and accounting software developer in Columbus, Ohio.

A user department created its own intranet to provide project plans and design requirements to 12 to 15 developers. Reason: Concerns about quick IS delivery and fear of pressure to store pages on corporate server.

Explains Chuck Krisak, development adviser: "Our being able to disseminate information was our problem— not an IT or corporatewide problem. Anything we were going to do to hurt us network [performance]-wise—we were just going to hurt ourselves."

Upside potential: IS stock rises by rescuing failing departmental intranet.

Downside risk: Things work just fine without IS, which erodes technical department's credibility and increases department's isolation.

Scheier is a Computerworld senior editor, management.



For an expanded version of this article, see our online version at www.computerworld. com/intranets.

Also on the site this month:

- Conference: "Right roles for IS"
- QuickPoll: "Is IS taking back the 'net?"
- Exclusive CW poll results:
   Who does what on intranets?
- Helpful resources

#### **Behind the Firewall**



Here's a tip: Get to know (and love) your company's knowledge workers.

Within three years,

they — not you — likely will be the higgest power source behind intranet development.

We recently asked 75 senior IS executives: In three years, who will be the source of power behind your push into the intranet? They said:

- CEO 5.7%
- Senior executives 17.1%
- · IS 7.1%
- User management 28.6%
- Knowledge workers 41.4%

That's a big shift from 1996 figures: IS, 43.1%; knowledge workers, 26.4%.

Sure, it's just a snapshot of a small group. But I'll bet they're right.

Gain power by giving it away.



Joseph Maglitta

# intranets

EDITOR

Joseph Maglitta

ONLINE EDITOR
Michael Fitzgerald

MANAGING EDITOR
Anne McCrory

Anne McCrory
ART DIRECTOR

Mary Hom
EDITOR, COMPUTERWORLD

Alan Alper

Phone: (800) 343-6474 E-mail: joe\_maglitta@cw.com Fax: (508) 875-8931 Online version:

www.computerworld.com/intranets

# ADVICE

By Collette Coad
Principal, Ernst & Young
Coad heads Ernst & Young's Center for Technology
Enablement. The organization has done three dozen
intranet/Internet projects for global companies.

ROLES: There are some real challenges here.

Most organizations haven't fully wrestled to the
ground the question, "Who really should own the
content?" Clearly, IS owns the infrastructure.

Many people have placed the webmaster in IS.

And the webmaster has a growing responsibility



for content management. Unfortunately, IT people have never been good at content management. That's not their role. Right now, someone

might make sure some logs are up to date, but more of those pages need to be corrected and undated.

TOOLS: Part of the challenge is that tools for managing intranet and Web content are so few and immature. It's like client/server 10 years ago. Until tools reach maturity, managing the cost and the links is going to outpace what anyone predicted.

We may need a new function that would review new content. Take pricing. Customer service reps need up-to-date price information, and they need to know about sales or promotions. Linking marketing with customer service isn't done today.

You need to manage all that and make sure information is rational, that inappropriate information isn't on the site. Companies are going to have to invest heavily in this kind of activity.

FOCUS: Don't let constant product announcements distract you from the need for a solid infrastructure. Put some stakes in the ground. You'll choose Windows NT or a Sun network operating system, a decision that focuses on what you can do from a Web server and a database perspective. The farther you get from the server, the more difficult it is to make a decision that will last 12 months or more. Put a stake in the ground for core technologies, and refrest on the fringe.

## PROJECTS



#### Lockheed Martin Corp.

Bethesda, Md.

Created by the 1995 merger of Lockheed Corp. and Martin Marietta Corp., it is the nation's largest defense contractor.

Andrea Pair, director of plans, policies and procedures at Enterprise Information Systems Co. (EIS), a division based in Orlando, Fla.:

#### What they're doing

Using intranets to disseminate information to 70,000 of the company's 190,000 employees. Individual departments and units have their own home pages. "I'd say there are at least 50,000 home pages. We have [internally developed] search engines that will index them for you if you are looking for a particular topic," Pair says.

#### Costs/Payoffs

Lockheed Martin doesn't have hard cost numbers, but Pair says the EIS WebServ group is spending "about \$50,000" to set up a server that will run Web pages so internal users don't have to buy their own servers.

Other projects are cost-justified on a case-by-case basis. Pair says Lockheed Martin has saved more than \$600,000 per year in paper costs.

#### Biggest people challenge

Getting upper management comfortable with the idea that employees weren't going to abuse the system. Pair's group has created an educational packet for meetings with executive staff that focuses on basic information and security concerns.

### Biggest technology challenge

Security, particularly for Lockheed Martin's energy-oriented units, which are connected to the Department of Defense network. "If we let them in to our intranet, it would mean that everybody in the DOD network would have access to our intranet," Pair says. So Lockheed Martin has, in some instances, given the energy

companies access to a server with a strictly controlled subset of intranet information. For other parts of the company, configuring and outfitting 70,000 PCs with software presents a major challenge.

#### Tools used

486-class PCs, Macintoshes and Unix boxes, in "various and sundry configurations." Netscape Navigator is the browser.

#### Next steps

Develop guidelines for Web publication. Look into eliminating all paper forms in favor of making them available through the intranet. Look into using Web technology to create a front end to Lockheed Martin's "heritage" applications.

By Steve Alexander, a freelance writer in Edina, Minn. He can be reached at sorion@ix.netcom.com.



For an expanded visit with Pair, see our online version at www.computerworld. com/intranets. Also featured:

- RealAudio interview: Pair
- Link to Lockheed Martin's
- THE TO LOCKHEEU MAIN

home page



# Netscape's James Barksdale on Informix.

James Barksdale President and CEO, Netscape Communications

> Jeff Hudson VP of Business Development, Informix

"Netscape partners with Informix because of its unique Web database technology.

Together, we provide customers an ideal solution for next-generation, high-performance, content-rich Web applications."

"The Web requires a database that combines high performance with the ability to manage a wide range of new datatypes—image, video, text, geo-spatial, and more. Informix and Netscape enable customers to quickly develop powerful, innovative Web applications that meet any business requirement."

At Informix, we deliver innovative database technology for a grow-

ing number of industry leaders worldwide. By teaming with companies who share our vision, we provide our customers with the solutions they need to stay ahead of change, make the most of emerging opportunities, and gain a competitive edge in business.

INFORMIX®

© 1996 Informix Software, inc. All rights reserved. The following are worldwide trademarks of Informix Corporation, Informix Software, Inc. or their subsidiaries, registered in the United States as indicated by @ and in numerous other countries worldwide. INFORMIX\* All other

#### Drill Down

#### Drill Down

#### Drill Down Drill Down

#### Drill Down

#### SERVICES

At \$4,800 per year (\$2,000 for clients), it ain't cheap. But Gartner Group, Inc.'s new Internet @vantage information service packs a punch: analysis, advice research from Gartner, Esther. Dyson, "Softletter" and much more. Details: www.atvantage.com.: phone: (212) 704-8274.

Daily Intranet News Service delivers all the intranet news that's fit to digitize from new

sources in North America and Europe.
Stillhoot enough? Check links to other related sites. Simware, Inc. Details: www.simware.com/news/index.html; phone: (613) 228-5116.

#### .....

"The Netscape Intranet Vision and Product Roadmap." A clear guide to the Land of a Thousand Releases. Online: home.netscape. com/comprod/at\_work/white\_paper/intranet/ vision.html.Email:info@netscape.com; phone: (415) 937-2555.

Never one to be intimidated by a big URL, Microsoft Corp. offers its intranet strategy at www.microsoft.com/intranet/documents/msinswp/intranetTOC.htm.

And for information on intranets and Office 97, try the links from www.microsoft.com/msoffice/.

#### **EXPLAINER**



#### **Intranet Roles**

Most organizations are still working out the most effective ways to develop and maintain intranets. In most cases, IS is taking a leadership role but working closely with USETS.

Computerworld Intranets recently polled 75 CIOs and senior IS executives in leading organizations about intranet roles and responsibilities. Their answers follow.















Numbers may not total 100% due to rounding.



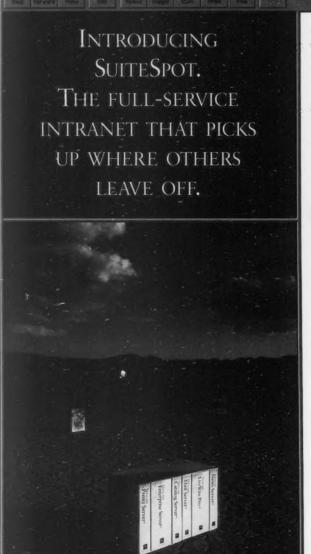
# Instant intranet. Just add Netra.

First it was the Internet, now it's the intranet. And everyone wants it built yesterday. You could try to throw together a bunch of hardware and software into a stopgap solution, or you could just unpack a Netra—the servers built specifically for the intranet. Pre-configured with Core 3.0 software to take advantage of the best Internet technology, Netra servers are the ideal foundation on which to run all your critical business applications. They outperform the competition and give you power to spare on even the most demanding sites. Solstice—FireWall-First!—security software and the Java—Developers Kit make sure you're safe and ahead of the curve. And with Netscape—Enterprise Server Software built in, it's little wonder Netra is the choice of intranet professionals everywhere. Perhaps that's why PC

Magazine and LAN Magazine have piled on the awards. But then what else would you expect?

After all, we're the intranet experts. For more information about what Netra servers can do for you, contact us at http://www.sun.com or 1-800-786-0785, Ext. 385. THE NETWORK IS THE COMPUTER





#### WHAT IS SUITESPOT?

Picture an intranet that's running at full potential. That's new Netscape SuiteSpot," the only integrated suite of server software that lets you build a Full-Service Intranet. With SuiteSpot, you can build network productivity applications that help you communicate, collaborate, and share information. Choose any combination of our five different software products: Netscape Enterprise, Mail, Neyls, Proxy, or Catalog Servers. SuiteSpot also comes with our application development and data access tool, LiveWire Pro."

	SPOT	OFFICE /	NOTES
Standards-Based Mail, Messaging & Discussion Apps	Yes	Proprietary	Proprietary
Standards-Based Distributed Search & Indexing	Yes	No	Only Thru Replication
Server-Based Java & Javascript	Yes	No	No
Native Support For Oracle, Sybase, Informix, & ODBC	Yes	opec only	CORC Only
Cost w/1,000 Clients	\$33,104	5178,064	\$277,820

#### SUITESPOT VERSUS ALTERNATIVE SYSTEMS

Unlike older, proprietary technology, only SuiteSpot's open-server product family allows you to build one architecture for Internet and intranet applications – one architecture that's cheaper and easier to maintain. And SuiteSpot easily integrates with current client/server applications running on Unix and Windows NT.

To learn more about SuiteSpot and the Full-Service Intranet, call for your free white paper, "The Netscape Intranet Vision," at 1-800-397-8582.



NETSCAPE

# COMPUTERWORLD THE MANAGER'S QUIDE TO WHAT'S REALLY IMPORTANT

Your corporate intranet – how are you going to manage it? Technology shifts always produce info-gluts: tons and tons of reports, product announcements, articles.

What's it all mean? Find out each month with Common to the contract of the

Find out each month with Computerworld Intranets, the manager's guide to what's really important.



# A MONTHLY MINI-MAGAZINE:

You'll get information on how you can put Web browsers and other standard Internet technology to work in your internal company networks. Once a month in *Computerworld* we bring you a "mini-magazine" of

highly focused pages that examine the critical intranet management issues you need to know.



#### IN THIS WEEK'S ISSUE:

- Analysis: Role models IS should empower users and contribute its expertise in infrastructure when setting up intranets.
- Projects: Lockheed Martin brings intranets to 70,000 global users. Annual savings from policies and procedures: \$600,000.
- Advice: IS should own the intranet infrastructure but think twice about managing content.
- Explainer: Our exclusive survey finds IS taking a leadership role — especially in funding — but working closely with users.

#### www.computerworld.com/intranets



#### @ONLINE:

For expanded practical advice and information that includes checklists, project plans, RealAudio interviews with other high-level managers and links to the best Internet resources. Plus interactive forums and polls to

help you find the best ideas and techniques while building your intranet.

#### TO REQUEST ADDITIONAL PRINT COPIES:

Contact: Sharon Bryant,
 Computerworld Reprints Manager
 Tel: (508) 820-8125
 Fax: (508) 875-0733
 E-mail: sharon\_bryant@cw.com.

Additional copies of Computerworld Intranets articles are available for \$4 each plus postage.

Published by:

#### COMPUTERWORLD

Everything you need to know.

Sponsored by

... and its business partner



**INFORMIX**°



### A DESKTOP THAT'S ACTUALLY CAPABLE OF



Talk about considerate. Beyond having a thermal sensor that tells you if it's too hot, the new Compaq Deskpro will warn you if its hard drive's about to fail anywhere. It's all part of what we call the next generation of Intelligent Manageability. Among other things, it



©1996 Compaq Computer Corporation. All rights reserved. Compaq and Deskpro registered U.S. Patent and Trademark Office. Deskpro is covered by our 3-year limited warranty. Dealer prices may vary. Features vary by model. Monitor not included. Thermal sensor available only on Deskpro 4000 and 6000. Some features available with Compaq Deskpro and independent software applications. Other features only available with Windows 95. The Intel Inside Logo and Pentium are registered trademarks and the Pentium Processor Logo and the Pentium Pro Processor Logo are trademarks of the Intel Corporation. Other products mentioned may be trademarks or registered trademarks of their respective companies.



give IS managers a broader range of integrated solutions. And to minimize installation and your configuration

TELLING YOU IT'S TOO HOT. Cool.

time, we provide



allows you to take inventory of all your hardware and software from one location. In case of hard drive failure, it backs up your data on the network; and now, thanks to our new PD-CD drive backup, it also preserves your data locally. There's even a sensor in

the hood that alerts the support desk if anyone's tampered with it.

Intelligent Manageability is still based on open industry standards that ensure compatibility and integration with any network. Our partnerships with Microsoft, Novell, Intel and others

integrated NIC and network-ready software which protects your investment and allows for growth. Ultimately what you get with Intelligent Manageability is lowered cost of ownership. Add to that a three-year warranty, plus dedicated toll-free technical support that's open for business seven days a week, 24 hours a day. Control. It's what makes the new Compaq Deskpro so hot. In a cool kind of way. For more information, visit us at www.compaq.com or call 1-800-392-8883.

COMPAQ

#### Editorial

## Exterminator

Netscape is accusing Microsoft of trying to exterminate it. But the question I have is why Microsoft would want to do such a stupid thing.

In a scathing letter to the U.S. Department of Justice dated Aug. 12, Netscape accused Microsoft of all sorts of anticompetitive sins, including pressuring PC makers to favor its Internet Explorer browser in exchange for price breaks; offering corporate customers irresistible operating system deals if they would discourage the use of Netscape's Navigator; and imposing licensing terms that restricted customers from using anything other than Microsoft Internet products. Nothing has been proved, and Microsoft has dismissed the whole thing as a publicity stunt.

If the charges are true, though, they paint a picture

of Microsoft as a software velociraptor bent on ravaging its enemies, which would be really dumb. The fact is, Microsoft can stamp out Netscape if it really wants to. The company has the cash to give away software for as long as it takes to win dominant market share. If innovation fails, it can simply outlast the competition.



But why would it want to? If Microsoft owned the Internet browser and server market, it would invite intense government scrutiny, which is the last thing it wants right now. In fact, Microsoft is so nervous about antitrust action that it is reportedly trying to shore up the Macintosh third-party market through a clandestine business group. It's hard to imagine why it would try to roll over a healthier competitor at the same time.

It is in Microsoft's best interest that Netscape remain an aggressive, vigorous rival. If Microsoft is resorting to nefarious tactics to kill this competitor, then its priorities are out of whack. Microsoft people like to brag that they are "paranoid," but paranoia shouldn't lead to extermination — at least not while the government has an open file on you.

Microsoft has asserted that its sales tactics aren't anticompetitive because consumers enjoy low prices and innovative products. Evidence of a conscious effort to extinguish a healthy rival would blow that argument apart. The elimination of Netscape would end the torrid pace of innovation that the Internet market has seen in the past 18 months. It would expose Microsoft to unprecedented scrutiny and unnerve consumers. I just don't see why Microsoft would do it.

Faul Gillin, editor

Paul Gillin, editor Internet: paul\_gillin@cw.com www.ultranet.com/~pgillin



#### Letters to the editor

### Cyrix received unfair grade

I am writing to express my surprise at the C+ grade given to the Cyrix 6x86-P166 in "Big problem doesn't KO Cyrix PC" [CW, July 29]. It is unfortunate that the machine tested had a faulty power supply, and I can sympathize with the frustration of the reviewers in solving the problem. But surely an isolated problem such as this doesn't warrant the whole product line being given this low grade.

The reviewers call the Cyrix machine "impressive" and "blindingly fast" and show that it outperformed a comparable Pentium-based machine in every case. In short, the machine performed exceptionally once the power supply problem was sort-

ed out. Why the low grade? Were James Connolly and Tom Lamoureux just grumpy that day?

Ken Morton

Reviewers' reply: No, we weren't grumpy. But it would have been a disservice to potential buyers to ignore a serious power problem. We had no way of being 100% sure it wasn't more common. As with any review, we had the one machine to work with and had to base a grade on that system.

To be fair, we then went the extra distance to seek out Cyrix and other users for feedback. If the problem hadn't come up, the score surely would have moved up a notch or two.

# CMA holds strong after 50 years

Your recent Page 1 article ("User groups strive to survive," CW, July 15] paints a rather bleak portrait of user groups present and future, citing only one example of a group that has experienced membership growth in the past two years.

The Communications Managers Association (CMA) has provided education to telecommunications, networking and information systems end users for nearly 50 years and is experiencing strong and healthy growth. Perhaps that is because CMA is sensitive to the very pitfalls outlined in your article. CMA programs are developed by users, for

users. And that is why more than 700 telecommunications/information technology professionals from more than 200 firms are members.

Matthew O'Brien CMA president Senior analyst Prodigy Services Co. obrienm@prodigy.com

### Shifty moves

I enjoyed Paul Gillin's editorial that had the bit on paradigm shifts ("Paradigm drift," CW, Aug. 5]. It seems to me the vendors' siren song of paradigm shifts is really about getting that "pair of dimes" shifting out of your pocket and into theirs.

Sean Nyberg Tampa Fla.

#### Isn't it ironic?

Am I the only one who sees the irony in "Year 2000, client/server linked" [CW, July 29]. For the past 10 years, those of us who worked on mainframe (legacy) software and were trying to make people aware of the problem were told, "There is no year 2000 problem. Those mainframe systems are going to be replaced by client/server systems anyway."

The reason there is a year 2000 problem is the client/server hype that discouraged people from taking corrective action on the problem.

Kishor Bapat Newbury Park, Calif.

#### Foolish thoughts

After reading "NT 4.0 beats clock" [CW, July 22], I called the local Egghead [Software store] and asked when it would have NT 4.0 in stock. "Our Microsoft rep was here this morning, and he promised 4.0 in October." The salesman replied.

I quoted the *Computerworld* article, and his response was, "You're a fool to believe anything Microsoft says." So it goes.

Mike Neal Director of network services School of Business Administration Portland State University Portland, Ore.

■Computerworld welcomes comments from its readers. Letters should not exceed 200 words and should be addressed to Paul Gillin, Editor, Computerworld, PO Box 9171, 500 Old Connecticut Path, Framingham, Mass. 01701. Fax number: (508) 875-8931; Internet: letters@cw.com. Please include an address and phone number for verification.

M. Arthur Gillis

# Opening soon: Microsoft National Bank

f Bill Gates can persuade the Justice Department to go easy on Microsoft's monopoly in PC operating systems, just imagine how easily he could persuade regulatory agencies to grant him a bank charter. Give up a few tons of documents, hold several meetings that consist of silly bureaucratic bantering and - voila! - he's got an \$18 billion de novo bank with millions of online "branches" overnight. And not a trowel of mortar needed.

Why speculate about the notion of a Microsoft bank? Because Gates is an impatient man. He doesn't believe bankers are moving fast enough to make home banking a success. The entrepreneurial instinct of such a highly successful person suggests that if conventional approaches don't work, he will bypass them and take over. Gates is a helluva marketer and promoter; he could sell the concept with pizzazz.

There's also a bit more to this proposition than meets the eye. A recent phone call from Microsoft's lead person in the home-banking fray revealed some interesting insights. First, the only reason this well-informed and well-connected gentleman called me is that he knows how I feel about home banking - it's a solution searching for a problem. I think he's trying to swing me (and at least one other highly visible skeptic) over to his camp.

Second, the executive said, home banking has to be sold aggressively by banks. He figures consumers aren't likely to rush in and sign up. He's

absolutely correct about the absence of a rush

The part about having to sell online banking aggressively to consumers worries me. If that's the case, then home banking is a cat that has already used up eight lives in the past 25 years.

Every major bank has tried home banking and

has failed. If the last chance depends on the typical banker's sales skills then home banking is dead for

Consumers are smarter than ever. Give them good reasons to switch, and they don't have to be pushed.

Home banking doesn't yet provide compelling

Today's consumers are in love with the checkbook. They aren't complaining about checks. (Banks, of course, hate checks because they're expensive to process.) Consumers don't want to expose their spending habits on the Internet, either. They just aren't ready to say, "I think I'll jump on the Internet today and pay my bills."

The promoters of home banking point to sur-

veys that show the increasing penetration of PCs in U.S. households. But that doesn't mean those PCs will be used for online banking. If a noll said 80% of U.S. homeowners have a back yard, does it mean they all want to plant tomatoes? Even banking's technocrats don't do online banking when

they go home

compelling reasons to bank from home are missing, then the next best chance for success will depend on a cultural shift

Maybe the future yuppies, who are now in grade school, will embrace home banking just because it fits in to their electronic lifestyles.

The "Gomwatms" - grumpy old men with all the money - will eventually fade out of the picture.

Home banking is a sure thing, once we find its right decade.

Gillis is president of Computer Based Solutions, Inc., a banking technology consultancy in Dallas. His Internet address is artgillis@aol.com.



Thornton Mau

Smart firms set up

"mind share

firewalls" to keep

out the charlatans.

# Too many experts, not enough expertise

he digital future has fallen into the clutches of the schmooze-oisie - pseudo experts engaged in content-free opinionizing.

The life and career of every CIO, technologist and end user is affected by wave after wave of high-priced, frequently wrong and rarely value-

producing "expert" opinion. Survival in the high-hype economy requires that we figure out what to do about the experts who aren't.

The half-life of expertise has compressed. Every month, organizations must assimilate modest product line extensions

into their technology base. Every six months, a major systems upgrade is required. Every nine months, a fundamental technology mutation emerges from the vendor community. In this rapidly recompiling world, one wonders how the experts keep up - what magic process do they use to stay on top of the intellectual food chain?

The pace of change, combined with corporate America's reduced head count (i.e., fewer heads to figure out the business implications of discontinuous technological developments), produced a period of good living for phrase-meistering industry analysts. But of late, the punditry market has balkanized into a confusing labyrinth of subspecialties and micromarkets.

The trade journals and rubber-chicken conference circuits are awash with experts for hire. Serious managers who seek to solve serious problems can't be sure who's worth paying attention to. So a new breed of expert has emerged: the expert on experts - the meta-expert.

This goes too far.

The expert biomass has reached a point of Malthusian unsustainability. Empirical evidence is pretty damning. Though the experts don't agree on much, they do share an inability to get the future right. Remember: The PC was supposed to make our lives

simpler, client/server technology would reduce the total costs of computing and the World Wide Web would be used to sell things. The sad reality is that large organizations will spend billions of dollars on bad consulting advice.

American CIOs, the sheriffs of the new cyberfrontier, are no longer standing by passively while noisy, matrix-toting child-gurus assault rationality, obfuscate technology futures and consume scarce corporate resources. The CIOs are saying, "Give us value or get thee gone, sound-bite-rich parasites!"

Successful organizations - which deliver su-

pranormal returns to shareholders and above-expected service to customers - have concluded that we live in a world with no Solomons. Smart companies are taking responsibility for figuring out the new value equation by themselves.

World-class companies have ceased the pursuit of gurus and are concentrating on demonstrating unambiguous progress toward their business objectives. They are rooting out the vestiges of nonproducing expert worship and setting up "mind share firewalls" to keep out the charlatans

With expertise comes responsibility. Insightful organizations require their experts to take an equity participation in the rollout of their guidance. Indeed, several organizations now require that benefits actually materialize before the experts collect their fees. Real experts guarantee their

Experts have a responsibility to create knowledge, whether in the library, the laboratory or the workplace. Experts should be dedicated to developing the capacities to reflect, create and understand. Whereas today's measure of expertise is how much you charge for a speech, in the posthype economy, we need men and women who can elevate our sights and ennoble our efforts.

May is vice president of research and education at Cambridge Technology Partners, Inc. in Cambridge, Mass.



Microsoft

push online

banking, but

aren't ready.

consumers just

plans to

CIOs should beware of pseudo experts engaged in content-free punditry.

His Internet address is tmay@ctp.com.

# HOM CAN



SEE IT FOR YOURSELF! WINDOWS NT EXHIBITION AUGUST 27-29, SAN FRANCISCO MOSCONE CENTER, BOOTH 501



# YOU TE

THE DIFFERENCE
BETWEEN AN NT
PROMISE
AND A REAL
NT SOLUTION?

**SEEING IS BELIEVING.** 

Today, the bright promise of Windows NT<sup>\*\*</sup> is a reality.

Amdahl is now delivering the first complete Windows NT solutions for the enterprise—the EnVista" family of enterprise servers, storage systems, software and highspeed connectivity solutions.

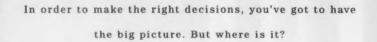
Based on clustered Intel Pentium Pro architecture, EnVista Central Servers and Frontline Servers support mission-critical applications with unsurpassed data access from the datacenter to the desktop.

Envista Channel for ESCON and Microsoft SNA Server software provide the world's fastest Windows NT server-to-mainframe connections at 10MB per second. And Amdahl LVS storage solutions offer continuous data availability—with scalable performance and capacity to meet the needs of your demanding Windows NT applications.

It's all shipping today. With Amdahl's award-winning global service organization standing by to plan, deploy and support EnVista solutions worldwide.

See real enterprise NT solutions for yourself. Today. Only at Amdahl: (800) 223-2215 or www.amdahl.com

amdahl



What computing solutions do you have?

You should have OpenView solutions from Hewlett-Packard, the clear leader in integrated network and systems management. HP OpenView gives you the power to evolve your IT environment as quickly as your business. We've already provided thousands of companies around the globe with higher service levels and availability. And we can do the same for you. If the business decisions are yours, the computing solutions should be ours.





DG, Unisys to share memory technology, 44

# Servers PCs

# Power portables

133-MHz systems from Compaq, Gateway are solid laptop performers

By Chris DeVoney

Even as 150-MHz Pentium machines take charge at the high end of the note-book sector, new 133-MHz systems from Compaq Computer Corp. and Gateway 2000, Inc. hold their own. The \$4,999 Compaq LTE 5300 and \$5,599 Gateway Solo 133 don't offer the most

features, smallest footprint or lightest case, but they have enough power to handle most tasks.



The LTE 5300, part of Compaq's full-size notebook line, weighs 8 pounds in the office (12 pounds when traveling with needed accessories), which is typical for portables that emphasize power over weight.

The 12.1-in. thin film transistor (TFT) display with its 800 by 600 resolution and 64,000 colors offers solid, crisp characters and good dynamic color range for presentations or full-motion video. The large keyboard has a comprehensible layout. The "eraser-head" pointer and buttons are comfortable to use.

Like other portables — including the Gateway 2000 Solo — the LTE 5300's 1-in. speakers deliver sound that a small group should be able to hear but that is too quiet for anything else. The solution

is to plug in external speakers to one of several multimedia and standard computer iacks and outputs.

The unit's flexible MultiBay add-in slot can hold a 3.5-in. floppy drive, a 5.25-in. floppy drive, a four-speed CD-ROM drive, a six-speed CD-ROM drive, an additional hard disk or a second lithiumion battery. You can also shed the

weight by leaving the bay empty.

Although the Multi-Bay holds one device at a time, you can swap the floppy and CD-ROM without restarting the system

under Windows 3.1, Windows NT 3.51 or NT 4.0. But you are out of luck with Windows 95, which doesn't allow such hot swaps.

Our unit was equipped with a swappable 1.35G-byte hard disk, a six-speed CD-ROM drive, a 3.5-in. floppy drive and 16M bytes of RAM. The LTE maxes out at an incredible 80M bytes of RAM.

The unit's performance was excellent. Although the video performance, measured using standard benchmarks, is about a fifth that of a desktop unit, the overall performance is on par with the fullest-featured — and one of the fastest — 133-MHz laptops we have seen, Toshiba America Information Systems' 720CDT.

Our only complaint was with the MPEG/TV adapter, an option that adds \$599 to the LTE's price. It came with device drivers that were corrupted. The adapter offers hardware playback for MPEG and CD-V movies on the computer, an external monitor or a television. Also, the adapter captures single-frame or full-motion video from NTSC or S-Video sources. Drivers delivered overnight by Compaq solved our problems.

In all aspects, the LTE packs enough of a wallop for office, programming, presentation or communications tasks. Short of computer-aided design and manufacturing (CAD/CAM) applications, which would need a faster display, the LTE could be a solid replacement for a desktop system.

#### Gateway's Solo 133

Don't be fooled by the seemingly high price of this unit. It is justified because the Solo 133 packs more into its 6-pound frame (10-pound travel weight) than you would imagine.

The Solo has an 11.2-in. TFT display with 800 by 600 resolution. Although that is smaller than the screens found on comparable portables, the characters are crisp, and the color dynamic range is adequate. But the drivers support only 256 colors rather than the 64,000 colors supported by most notebooks.

Compaq and Gateway, page 44



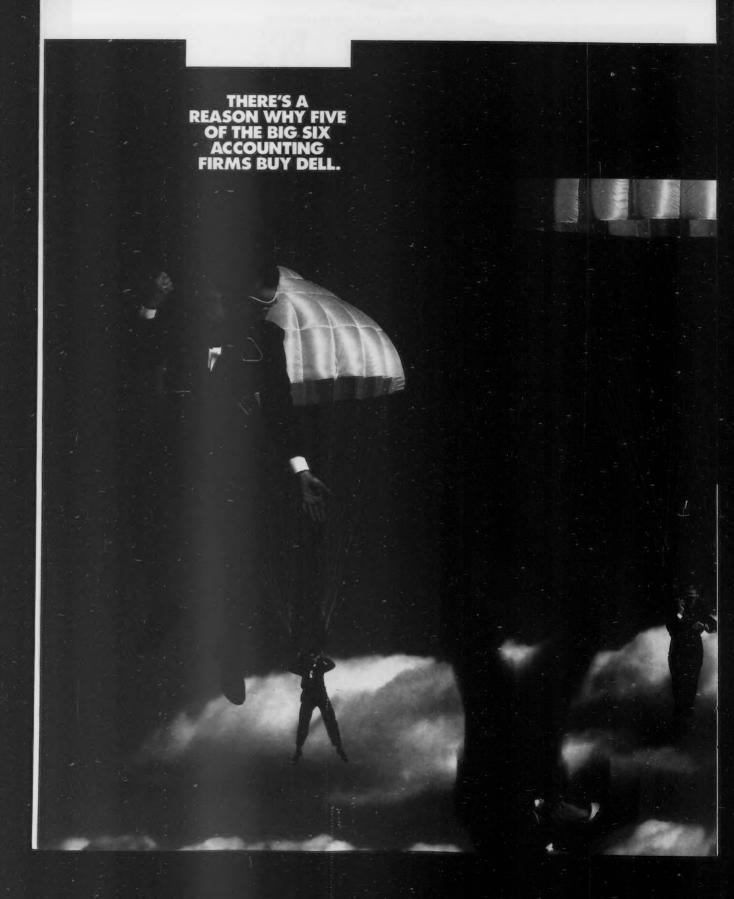
Price: \$5,599

YOU DON'T GET TO BE AMERICA'S SECOND LARGEST SUPPLIER OF BUSINESS PCs UNLESS YOU KNOW WHAT AMERICA IS LOOKING FOR IN A BUSINESS PC.



http://www.dell.com

Source: International Data Corporation. Dell and the Dell logo are registered trademarks of Dell Computer Corporation. @1996 Dell Computer Corporation. All rights reserved







"Risk" is hardly an accountant's favorite word. So for our Big Six customers to invest more than \$56 million in Dell PCs over the past 12 months, they had to feel that it was an incredibly safe move. Here's why.

For one thing, the computers we build are built for big business. They're custom-built, in fact, in ISO 9002 certified facilities to give our customers the power of industrial-strength computing. And they're built with industry-standard parts, instead of proprietary ones, and backed with a guarantee of network compatibility.

For another, we really understand how to work with big business. We know that keeping our machines up and running isn't just an imperative, it's mission-critical. Which is why we deploy a nationwide army of local account executives and systems engineers into the field each and every day.

How did we get all this first-hand knowledge of our customers? By staying in touch with our customers at every turn, from selling directly to them to answering the phones when they call for service. A way of doing business that 6 of the 8 biggest airlines, 12 of the 13 largest telecommunications companies, 4 of the 5 largest mutual insurance companies – in fact, 80% of the Fortune 500 – wouldn't have any other way.

So if you're looking for a computer company that really understands big business, Dell's the place to land.

### **DELL** 800-847-4068

http://www.dell.com

Mon-Fri 7am-9pm CT • Sat 10am-6pm CT • Sun 12pm-5pm In Canada,\* call 800-839-0148

Keycode #12111





3Com

The Intel Inside logo and Pentium are registered trademarks of Intel Corporation, Microsoft, Window and the Windows NT logo are registered trademarks of Microsoft Corporation. The 3Com Network Beach Love, is a trademark of 100 m Demostration (17/1096 Dell Computer Companies) and Intelligence of the Computer Companies (17/1096 Demostration All Intelligence and I

# Thanks for the memory: DG, Unisys to share technology

By Michael Goldberg

A technology-sharing deal recently announced by Data General Corp. and Unisys Corp. should help those vendors bring greater scalability to their multiprocessing servers, users and analysts said.

Under the pact,

Illuminat Nashua, 1 For us to bette availability to their multiprocessing servers, users and analysts said.

Symmetrical

Under the pact, DG will make its NumaLiine shared memory technol-

ogy available to Unisys to use in its symmetrical multiprocessing (SMP) servers. In turn, Unisys will let DG include its Scalable Coherent Memory bus technology in its Aviion servers.

DG, in Westboro, Mass., and Unisys, in Blue Bell, Pa., are using the technology in computer families that use Intel Corp. processors. And both companies are emphasizing their support for the SCO, Inc. UnixWare operating system, although DG will continue to support its own Unix variant, DG-UX.

#### Savings shared, too

Sharing those important traits lets the companies pass along engineering cost savings to users while offering servers that potentially could scale to dozens of processors, analysis said.

"By hook or by crook, these companies were going to have to do these things anyway. And by doing it as a business relationship, they'll get it done faster," said Jonathan Eunice, president of Illuminata, Inc., a research firm in Nashua, N.H.

For users, the deal "translates to better performance, higher availability and more scalability things that end users are looking

for as they move from PC LAN environments" up the enterprise computing chain,

said Jerry Sheridan, a principal analyst at Dataquest in San Jose, Calif.

multiprocessing

Users said they were generally upbeat and added that they saw the companies' move to embrace Intel as an important long-term business decision, even if it presents challenges in future migrations from older technologies.

"From my perspective, it's very positive. The Motorola [chips that DG was using] were at a dead

#### Impact of the deal

DG will use Unisys' Scalable Coherent Memory bus in its Aviion servers

Unisys will use DG's NumaLline technology in its symmetrical multiprocessing servers

Users should see more scalable computers at some costsavings from the two vendors end, not going anywhere," said Juan Fernandez, director of MIS at Cigna Dental Health, a dental health maintenance organization in Plantation, Fla.

"DG is making the right move for their company," said Bob Ostrow, a vice president at Bloomberg Financial Markets in New York, another longtime DG user. "If they can improve price/performance, that's even better."

Cigna and Bloomberg use earlier versions of DG's NumaLiine servers that run with Motorola, Inc. processors and the DG-UX operating system.

NumaLiine contains NUMA technology, for Non-Uniform Memory Access. NUMA uses memory-sharing techniques across processing units to give a system with many processors a single-system image. That means customers can use applications for an SMP system in computers that have large numbers of processors without rewriting their programs.

DG's first NUMA-based servers that use Intel's Pentium chips are due late this year or early next year. Unisys officials said their company's versions will follow mickly.

Observers said DG could use Unisys' Scalable Coherent bus technology to bring out a server that uses Pentium Pro chips — up to 10 processors in one box — more quickly than planned.

# Centralized storage management across platforms on the rise

By Jaikumar Vijayan

Storage vendors are accelerating their efforts to offer centralized storage management capabilities across multiple hardware platforms and operating systems.

Last week, for instance, Seagate Software Storage Management Group became the latest vendor to jump into play, with a product aimed at networks that run both Microsoft Corp. Windows NT Server and Novell, Inc.'s NetWare operating systems.

The company's latest Seagate ExecView software can be loaded on either an NT Server or a Windows 95 client and lets network administrators monitor scheduled, active and completed backup operations from a central console. The product also lets administrators identify and respond to backup operations that require attention.

#### **Increasingly common**

Those kinds of management capabilities are becoming standard features in storage products as user environments become increasingly complex, analysts said.

For instance, vendors such as IBM, Cheyenne Software, Inc., Legato Systems, Inc. and Sterling Software, Inc. offer varying levels of centralized storage management across different hardware platforms.

"For any software utility to survive in a multiple platform, multiple operating system environment, it has to be compatible all the way across," said Robert Abraham, a vice president at Freeman Associates, Inc., a market research firm in Santa Barbara, Calif.

"Users are simply going to demand and take for granted that this kind of capability will be pro-

vided" in storage management products, he said.

One such user is Belcan Engineering in Cincinnati. The company, which uses five NT and Net-Ware servers for backup operations, welcomes cross-platform management products such as Seagate's ExecView.

"It used to be a nuisance to go to each server individually to check if everything was running properly. ExecView allows me to do the same thing from one spot," said Paul Badowski, senior network specialist at Belcan.

#### Backing up the enterprise

Seagate's latest backup software supports a numbe of capabilities including:

#### Backup Exec for Windows

- NT v6.11 • SQL Server
- Exchange server

#### Backup Exec for NetWare V7.11

• NDS support

 SureStart startup environment

#### Seagate ExecView v2.01

 Cross-platform functionality
 Real-time statistics and alerting

The new software will be available later this month in 5-, 20 and 50-server versions. Prices start at \$1,395 for five servers, \$3,595 for 20 servers and \$5,595 for 50 servers.

In addition to ExecView, Seagate last week also announced Backup Exec for NetWare version 7.11. The release includes many enhancements over the previous version, including full integration with Novell's NetWare Directory Services start-up diagnostics and support for the NetWare Administrator utility.

### Compaq's, Gateway's solid 133-MHz portables

CONTINUED FROM PAGE 41

The screen is acceptable for many applications but inadequate for showing photorealistic images — as with some presentations or multimedia products — or using mundane software such as the Windows 95 Plus Pack's font smoothing, which requires 16-bit color depth.

The Solo's keyboard isn't as big as the LTE's, but it is the same size as most other notebook keyboards and is as comfortable as most. The 2-in. square touchpad pointing device and buttons get a favorable nod, but you might want to try out the touchpad before buying if you aren't familiar with the concept. It provokes strong reactions, pro and con.

The Solo wasn't designed with the flexibility of the LTE. The unit can hold either a 3.5-in. floppy or a CD-ROM at one time, but not both. Unlike the LTE, you can't hot-swap drives, which makes installing some device drivers or Windows NT 4.0 frustrating because you may need floppy disks and a CD-ROM to load those drivers.

For \$5,599, you get a 1.35G-byte hard disk, a 1.44M-byte floppy drive, a six-speed CD-ROM drive and two batteries (each tested powering the unit for more than 3½ hours). The package also includes a soft case for the floppy/CD-ROM that isn't mounted in the computer, a comfortable carrying case, a 28.8K bit/sec. fax/modem PC card, a choice of Windows or Windows NT, Microsoft Office and a variety of other utility and communications software. It also sports a whopping 40M bytes of

RAM — an amount you don't see in other notebooks at this price.

That 40M bytes plays a big role in the Solo's performance. Under Windows 95, the Solo 133 was an astonishing 50% faster than the Toshiba 720CDT or Compaq LTE 5300 when running 16 and 32-bit applications. Some of the Solo's performance is owed to paltry color depth. But programs under Windows 95 or Windows NT get solid benefits from the capacious RAM.

Don't expect this notebook to replace a desktop running CAD/CAM or any application that needs full color. But as a portable, the Solo 133 is a solid product with respectable performance in everything else.

DeVoney is a technology writer in

#### Brief

## Sun unveils fault tolerance

Sun Microsystems, Inc. introduced a pair of fault-tolerant servers based on its SPARC architecture and targeted at the telecommunications industry. Sun added the Ft-SPARC machines to its lineup when it purchased U.K.-based Integrated Micro Products. The servers start at \$100,000 and will ship this month. Meanwhile, Sun's SunExpress unit, which sells add-on devices and peripherals, expanded its Internet-based service to let registered users buy products online.





#### DELL' LATITUDE' XPI P133ST 133MHz PENTILIM® PROCESSOR

- 11.3° SVGA Active Matrix Color Display
- · 24MB RAM/1.2GB Hard Drive
- · Smart Lithium Ion Battery with Enhanced Power Management<sup>11</sup> (results in over 4 hours of battery life).
- · PCI Bus Architecture with 256KB 12 Cache
- 128-bit High Performance Video with Integrated Video RAM
- Integrated 16-bit Sound
- · Infrared Port
- 28.8 XJACK® Modem/Leather Case
- · 3 Year Limited Warranty

#### DELL LATITUDE LM P133ST 133MHz PENTILIM PROCESSOR

121° SVGA Active Matrix

- Color Display
- 16MB RAM/810MB Hard Drive
- · Options Bay accepts 4X CD-ROM, 3.5° floppy (both included), or
- 256KR 12 Cache
- · Integrated 16-bit Sound with Stereo Speakers
- 128-bit High Performance
- · Infrared Port
- · Extra Smart Lithuim Ion Battery
- · 3 Year Limited Warranty

#### 200MHz PENTIUM PROCESSOR

200MHz PENTIUM PRO PROCESSOR

**DELL OPTIPLEX® GXpro 200** . 64MB EDO ECC DIMM RAM

Product Code #600200

- · 2GB Fast SCSI Hard Drive
- · 256KB Internal 1.2 Cache
- 17LS Monitor (15.7" v.i.s., .28NI) . #9 Imagine II PCI Video Card with
- 4MB Video Memory
- 8X FIDE CD-ROM
- · Integrated Vibra 16 Audio

- \* Now Windows NT 4.0 Upgrade Coupon at No Extra Charge
- 3 Year Warranty<sup>1</sup>

#### **DELL POWEREDGE® XL 5166-2**

TWO 166MHz PENTIUM PROCESSORS (Expandable to Quad Processor)

- 256MB ECC RAM
- Three 4GB Fast/Wide SCSI-2 Hard Drives
- . 512KB Write Back Cache
- · Intel® Pro 10/100 PCI NIC
- · 15TX Monitor (13.7° v.i.s., .26NI)
- Mylex RAID Controller
- 6X SCSI CD-ROM

- Optional 2nd Li-lon Battery. PCI Bus Architecture with

- Video Controller

- · Microsoft Office/Leather Case

Product Code #600416

#### **DELL OPTIPLEX GXpro 200**

- . 32MB EDO ECC DIMM RAM
- · 2GB FIDE Hard Drive
- · 256KB Internal L2 Cache
- 17LS Monitor (15.7" v.i.s., .28NI) . #9 Imagine II PCI Video Card with 4MB Video Memory
- · 8X FIDE CD-ROM
- · Integrated Vibra 16 Audio
- Windows NT® with 1 Year Support
   Windows NT with 1 Year Support
  - \* Now Windows NT 4.0 Upgrade Coupon at No Extra Charge
  - · 3 Year Warranty

#### 540/

Product Code #300182

- 4/8GB DAT Tape Backup
- · On-site<sup>a</sup> Set-up and Validation · SafeSite™ Server Management
- System
- 1 Year DirectLine<sup>su</sup> NOS Support 4 Hour Dell BusinessCare<sup>™</sup> Warranty<sup>†</sup> (5x10)

#### DELL LATITUDE LM P133ST 133MHz PENTILIM PROCESSOR

- 12.1° SVGA Active Matrix Color Display
- · 24MB RAM/1.3GB Hard Drive
- . Options Bay accepts 4X CD-ROM, 3.5° Floppy (both included), or Optional 2nd Li-lon Battery.
- · PCI Bus Architecture with 256KB12 Cache
- · Integrated 16-bit Sound with Stereo Speakers
- 128-bit High Performance Video Controller
- Infrared Port
- 28.8 XJACK Modem/Leather Case
- · 3 Year Limited Warranty

#### PICTURED SYSTEM

Product Code #600408

#### **DELL OPTIPLEX GXpro 180**

180MHz PENTIUM PRO PROCESSOR

- . 32MB EDO ECC DIMM RAM
- · 1GB FIDE Hard Drive
- · 256KB Internal L2 Cache
- 15TX Monitor (13.7" v.i.s., .26NI) . S3 Trio V+ PCI Video Card with
- 2MB Video Memory
- · 8X FIDE CD-ROM
- · Integrated 3Com PCI EtherLink III
- · Microsoft Office Pro 7.0
- · Windows NT with 1 Year Support \* Now Windows NT 4.0 Upgrade Coupon at No Extra Charge
- · 3 Year Warranty

#### **DELL POWEREDGE XL 5133-2** TWO 133MHz PENTIUM PROCESSORS (Expandable to Quad Processor)

- 128MB ECC RAM
- · Three 4GB Fast/Wide SCSI-2
- Hard Drives • 512KB Write Back Cache
- · Intel Pro 10/100 PCI NIC
- · 15TX Monitor (13.7" v.i.s., .26NI)
- · Mylex RAID Controller · 6X SCSI CD-ROM

#### DELL LATITUDE LM P100SD 100MHz PENTILIM PROCESSOR

• 11.3° SVGA Dual Scan

- Color Display
- 24MB RAM/1.3GB Hard Drive
- · Options Bay accepts 4X CD-ROM, 3.5° Floppy (both included), or Optional 2nd Li-lon Battery.
- · PCI Bus Architecture with 256KB12 Cache
- · Integrated 16-bit Sound with Stereo Speakers
- · 128-bit High Performance Video Controller
- · Infrared Port
- 28.8 XJACK Modem/Leather Case
- · 3 Year Limited Warranty

# **DELL OPTIPLEX GX 5166M**

166MHz PENTIUM PROCESSOR

Product Code #600409

- · 32MB EDO RAM
- · 1GB EIDE Hard Drive • 256KB Pipeline Burst Cache
- 15TX Monitor (13.7" v.i.s., .26NI)
- 2MB Video Memory
- Integrated Vibra 16 Audio
- Integrated 3Com EtherLink III MS° Office Professional
- with Bookshelf · 8X EIDE CD-ROM
- · 3 Year Warranty

SYSTEM NOT PICTURED

- · On-site Set-up and Validation SafeSite Server Management System
- · 1 Year DirectLine NOS Support
- · 3 Year Dell BusinessCare Warranty

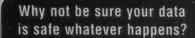




\*At no extra charge, get Microsoft Windows NT Server in the package or pre-installed on your hard drive with each server you buy. Offer ends 9/30/96. "Offer valid in the U.S. only and applies to this system if purchased before 9/00/96. Ffor a complete copy of our Guarantees and Limited Warranties, please write to Dell USA L.P., 2214 W. Braker Lane, Suite D. Austin, TX 78798 ITVier-Test Cross-Country tests simulate typical executive use of Windows 95 applications. Power Management was enabled, 9/M8 RAM was installed. \*Prices and specifications valid in the U.S. only and subject to change without  Where the world's information goes.

back from the dead?

Is client/server
really on the ropes?



With information technology, the only thing that's certain is that everything will change. The next technology you commit to could lead your company into the future. Or it could wind up as landfill. So at StorageTek,\* we design flexible technologies that let you keep your options open. We've developed a full line of storage solutions to work with different architectures, different platforms and different kinds of networks. Want the details? Just call 1 800 922-3260, ext. 1401. Or visit us on the Web. Either way, we're flexible.



#### New Products

Olympus Image Systems, Inc. has unveiled SYS.230 SCSI Personal Storage System

According to the Melville, N.Y., company the product is a lightweight optical storage device that reliably stores hundreds of images on 230M-byte cartridges. It was designed for print graphics and digital camera image storage for backing up and archiving files and databases and storing music.

Each cartridge costs \$10. The cartridges resist shock, magnetic fields and dust and are rated for 30 years of archival-quality storage. The device works in either vertical or horizontal orientation. It requires Apple Computer, Inc.'s Mac OS 6.0.7 or higher, a Macintosh Classic or greater, Windows 3.x, Windows 95, Windows NT or DOS 5.0. PC

users also need a SCSI adapter.

Pricing for SYS.230 SCSI Personal Storage System starts at \$299 for an internal

Olympus Image Systems (516) 844-5000

www.olympusamerica.com

Hewlett-Packard Co. has introduced HP E2920 PCI, a series of computer verification tools for designers who develop,

debug and validate products.

According to the Palo Alto, Calif., company, the tools include a Peripheral Component Interconnect (PCI) exerciser and analyzer with a fully in-system-programmable PCI master and target device, a PCI analyzer user interface for Windows 95 and Windows NT operating systems for interactive analysis of PCI bus traffic and a PCI exerciser user interface for Windows 95 and Windows NT for interactive debugging.

Each tool is sold separately. Pricing starts at \$2,950.

► Hewlett-Packard (415) 857-1501 www.hp.com

Pacom Data. Inc. has introduced two Super VGA monitors, models CL15E and CI 17

According to Fremont, Calif., company, the monitors ofplug-andplay capabilities, color control features and three-year warranties. They can be used in PC or Macintosh configurations.



Pacom Data's 17-in. CL17 Super VGA monitor has blug-and-blay capabilities

The monitors have 1,280 by 1,024 dot/in. resolution and on-screen display digital controls. The CL15E has a 15-in. diagonal flat screen. The CL17 has a 17-in, diagonal flat screen.

The CL15E costs \$379. The CL17 costs \$679

Pacom Data (510) 440-7200 www.bacomdata.com

Sharp Electronics Corp. has announced PC-9080, a high-performance, 133-MHz Pentium-based notebook computer.

According to the Mahwah, N.J., company, PC-9080 weighs 7.3 pounds and can display IBM's Extended Graphics Array 1,024 by 768 dot/in. format images on its 12.1-in. screen. It features a 64-bit Peripheral Component Interconnect designed to let users increase system performance and functionality. It also has a six-speed CD-ROM drive, a built-in 28.8 bit/sec. fax/modem, MPEG 1 software for video compression, a removable 3.5-in. floppy drive, 2M bytes of video RAM and a touchpad pointing device.

Pricing for PC-9080 starts at \$6,000.

➤ Sharp Electronics (201) 529-8731 www.sharp-usa.com



# The Internet Commerce Expo

September 9-12, 1996, Anaheim Convention Center, Anaheim, California.

Dedicated to the development of internet commerce via the World Wide Web and the growth of the corporate intranet.

Hot Event. Cool Customers.

If you're a corporate decision maker, ICE is your best opportunity to find the productivity enhancing solutions you've been looking for.

Hundreds of leading hardware, software, and network services vendors will be at ICE to show you how to increase productivity and profitability via the latest internet technology.

A special 3-tier conference will provide a full range of hot topics that deal directly with the needs of developers, IT managers, business managers and senior executives.

And you won't want to miss The Internet Open-an exciting new floor show that will get everyone fired up with the industry's largest-ever on-line demonstration of user applications for the World Wide Web.

If it's hot, it's here.

This is a must-attend show. So mark your calendar now for get where it's hot!

To register and pay on-line: visit our Web site at http://www.idg.com/ice. Or call 1-800-667-4ICE (4423). Or fax 1-508-370-4325.

Internet Commerce Expo 111 Speen Street, PO Box 9107 Framingham, MA 01701

CIO



WEBMASTER COMPUTERWORLD NetworkWorld #IDC





# [Un]tangling

The Intricacies

of

Distributed

Computing

In retrospect, the era of mainframe computing was relatively simple.

In today's distributed computing environments, things are very different.

# Integrating and managing the IT infrastructure in the enterprise of today can be an overwhelming job.

In retrospect, the era of mainframe computing was relatively simple. Mainframe environments consisted of only seven major components — the host computer, front-end processors, controllers, terminals, modems, dedicated private lines and application tools. For each of these products, there was only a handful of suppliers to choose from.

# Distributed computing presents complex challenges

In today's distributed computing environments, things are very different. These environments are vastly more complex, containing hundreds of devices from superservers to PCs; from portable computers to cellular devices; from hubs and routers to gateways and switches; from printers to storage devices. There are hundreds of PC manufacturers and suppliers of communications devices and thousands of vendors of peripheral devices and software. The result? Piecing together the right combination of computing and communications equipment has become a daunting task for technology decision makers everywhere.

Not surprisingly, companies implementing client/server architectures can end up with one-of-a-kind mixtures of hardware, software, operating systems and communications devices. For instance, a Banyan VINES network might be dedicated to the applications

of one department, while other departments might be running applications on Windows NT and Novell. And while one department runs NT on Compaq servers, another has Sun workstations running UNIX. Vital network management devices often come from different vendors. And who knows what software is on each PC? Simply put, integrating and managing the IT infrastructure in the enterprise of today can be an overwhelming job.

#### Telecommunications technologies are proliferating

The same is true for many companies' telecom systems, due to the proliferation of new communications technologies. And the situation is getting even more challenging as computing and communications technologies merge. Companies need to be assured that their current and future network and devices can interoperate. They require systems that can connect all the pieces today's PBX systems, computer telephony applications, Internet and intranet applications, wireless and infrared devices, network services, and voice, data, image and video - into the emerging world of broadband, multimedia communications.

# End-user support costs are significant

Another factor to consider is the cost of end-user support. According to a

# An organization devotes so to the management and support of the transfer of th

Challenges of distributed computing

- Convergence of communications and information
- Complexity of integrating technologies
- Thousands of hardware and software choices
- Increasing costs for end-user training and support
- Multi-vendor compatibility issues

report from the Cartner Group titled "Total Cost of Ownership: A Powerful Management Tool," support labor represents over 70% of the total cost of ownership in a client/server environment. And over time, the labor component continues to increase, while technology decreases as a percentage of the total cost of ownership. With the growing cost of supporting end users – including education, systems operations and maintenance – client/server computing solutions must include resource and system strategies designed to minimize cost creep.

For example, the average user requires \$250 worth of support per month alone for anything from logging in, changing passwords or getting system problems resolved. In fact, the overall cost to equip and support an end user with a LAN-connected workstation can range from \$6,000 to \$12,000 a year, depending on how often a support engineer must be dispatched on-site, according to G2 Research, Inc., a market research and management consulting firm in Mountain View, California.

#### Global issues are driving technology

In addition, the internal technology issues facing today's organizations are exacerbated by issues of a more global nature, including:

 blurring of national and international business boundaries

- · emphasis on speed to market
- growing role of technology as a competitive asset
- advent of supply chain integration, inter- and intracompany data sharing and communications
- growing reliance on technology for mission-critical business applications
- growing need for business to integrate telecommunications and LAN/WAN capabilities

What often happens is that an organization devotes so much time, money and attention to the management and support of its IT infrastructure that it has to divert resources away from its core competency. And if that organization decides to seek outside help, the services of several companies are usually required, resulting in multivendor compatibility problems and a more precarious planning process.

Effective outsourcing requires infrastructure and technological expertise

If third-party outsourcing companies are to provide corporate customers with a strategic edge in today's era of technology convergence, they need more than just voice or data or networking capabilities. They need to have a sound network infrastructure

o much time, money and attention t of its IT infrastructure that s away from its core competency.

coupled with proven expertise in implementing and managing distributed computing environments.

Until recently, few outsourcing companies offered such a comprehensive solution. And those that did charged high prices. Maybe a Fortune 500 corporation could afford a comprehensive management service for its distributed

Corporations are starting to realize how costly and time consuming it is to implement and maintain custom solutions. However, a supplier who offers pre-packaged solutions — comprised of state-of-the-art hardware and software from a select group of "best-of-breed" vendors — can significantly reduce both deployment time as well as requirements for ongoing sup-

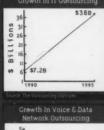
\*\*IEven the biggest companies are seeing a real competitive advantage in time-to-market, so they are opting for more quickly implemented and low-maintenance, standardized solutions.

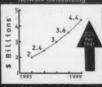
computing resources, but most of the 60,000 mid-sized companies in the United States could not. Instead, IS managers of those mid-sized organizations toiled to create a strategic infrastructure with limited financial and personnel resources, while demands for their time constantly increased.

# Standardized solutions offer significant advantages

Today's small and mid-sized companies need cost-effective and affordable solutions that can be tailored to their particular business requirements and then implemented quickly, easily and efficiently. port. With open systems standardsbased solutions, small to mid-sized customers can gain access to the leading-edge technology used by large corporations without making costly investments in rapidly changing technology.

"Even the biggest companies are seeing a real competitive advantage in time-to-market, so they are opting for more quickly implemented and low-maintenance, standardized solutions," says Greg Jacobsen, Executive Vice President of Business Strategy and Marketing with SHL, a leader in large-scale systems integration and client/server migration based in Ottawa, Canada. "From Fortune 100 to Fortune 1000 companies, the game now is speed."





How big is the trend toward outsourcing?

According to The Outsourcing Institute, in 1995, corporate America spent over \$38 billion on IT outsourcing. That meant that \$1 of every \$12 spent in corporate America on IT last year flowed through an outsourcing contract.

In addition, voice and data network outsourcing is a \$2 billion market today that will grow by 22% per year through 1999



#### SHL in brief

SHL, an MCI° company, is a \$1 billion company that originated in Canada over a decade ago. Since that time, the company has been considered a leader in large-scale systems integration, outsourcing, technology deployment and client/server computing migration. The company is also credited with having defined the Transformational Outsourcing services market.

SHL has traditionally focused on three areas of IT expertise:

- Deployment of desktop services, for which SHL provides the hardware, training and support services such as help desks.
- •Transformational Services, for which SHL helps customers manage their mainframe applications and the transition to client/server environments.
- Outsourcing, for which SHL provides everything from simple help desks to staffing and managing data centers.

Based on customer requirements, SHL can tailor the solution it offers in any one of these areas or, if a full-service solution is needed, in all three.

The company has over 100 sales and service offices, as well as six outsourcing centers (two in the U.S., three in Canada, and one in the U.K.) with a seventh to open soon in Korea. Overall, SHL has more than 6,000 employees in 32 countries.

SHL was acquired by MCI Communications Corp. in November 1995 and is now MCI's systems integration and IT outsourcing subsidiary. An enterprise services offering is the first package of services to be jointly marketed by MCI and SHL. The package combines MCI's expertise in switched data and Internet services with SHL's leadership in developing and managing client/server solutions for businesses.



# Hiring outside communications for companies tomorrow.

The standardized solutions required by this new competitive environment mark the beginning of a big change for the third-party outsourcing business which in turn means more value for customers of this service.

With a standardized solution, the problem-solving process is streamlined as well. Problems that arise are rarely unique and can be resolved quickly — often by telephone. Faster problem resolution will eliminate the frustration users feel toward a changing technical environment, making them more productive in their core business functions.

## Providing a total solution

Until recently, a mid-sized business looking for a computing and communications solution that could be tailored to its unique client/server environment had to go to one company for network transport needs and another for network management. "Most companies were unable to reap the full benefits of systems integration because there was no single vendor who could effectively combine the power of communications and information technologies," says Brian A. Brewer, Senior Vice President. Business Marketing for MCI Communications Corp.

e experts to handle increasingly complex s and computer solutions will be the rule s that intend to compete in the arena of

But that situation changed in November 1995, when MCI acquired SHI. The teaming of the two companies allowed them to create a solution that combines MCI's expertise in switched data and Internet services with SHI's leadership in implementing and managing client/server environments for Fortune 500 businesses.

MCI's solution for managing enterprise networks

Beginning in June 1996, this new service will be offered initially to companies with 50 to 500 desktops and up to 10 servers. The turnkey service includes, as standard offerings, proven open-

"Customers today are looking for integrated computing solutions combining networking and telecommunications technologies. Bay Networks has forged sophisticated business and technology partnerships with leaders like SHL and MCI to provide customers with the best turnkey solutions in the marketplace." Jeff McCarthy, Bay Networks' Vice President of Carrier & Integrator Operations.

"We've done much more than just merge the technological elements of computing and communications," says Brewer of MCI. "We've created comprehensive outsourcing solutions designed to solve the special challenges faced by mid-sized businesses across all industries. Specifically, we've standardized what was previously customized - and therefore affordable only to the largest companies - which enables us to bring our solutions within reach of the middle market. And even though our solutions are standardized, they can still be tailored to the specific needs of each customer."

system components such as Compaq ProLiant servers running either Microsoft Windows NT Server 3.51 or Novell NetWare 4.1, hubs from Bay Networks, and routers from Cisco Systems. Standard software applications include Microsoft Office for LANs with management tools provided by Intel.

MCI expects that customers for its new tumkey enterprise management support services will be mainly mid-sized companies, but notes that large departments of multinational corporations might also be potential customers. Even though our solutions are standardized, they can still be tailored to the specific needs of each customer."

Infrastructure transition and stabilization

The offering is geared to organizations wishing to acquire, or transition to, a Microsoft NT or Novell NetWare network environment. For those who have existing Microsoft NT or Novell NetWare architectures, this service will eliminate the need to manage the intricate day-to-day operations of running these networks. For those organizations transitioning from another client/server architecture, arrangements can be made to replace the existing equipment with new upgraded hardware and software.

The transition will include a comprehensive audit and assessment of a company's existing infrastructure as the basis for development of an implementation plan. In this way MCI can provide its customers a significantly enhanced operating environment. Organizations and institutions wishing to embark on a new client/server architecture can lease the basic infrastructure, including servers and software, from MCI. Down the road PCs may be also included in the lease. If so desired.

Whether a company is starting out on the road to client/server or they are well on their way, the experience MCI has gained from its growing customer base will benefit each company through lower annual per-user costs of equipping, operating, maintaining and servicing their installed hardware and software base.

Proactive systems monitoring and management

Historically, management and support in a client/server environment were often overlooked, due primarily to a failure to foresee the complex interoperability problems posed to users by this powerful new architecture. Thus, the notion of management and support developed in an ad hoc manner, fragmenting along departmental and operational lines. This fragmented management and control forced users to develop their own informal networks of support, creating invisible costs and inefficiencies in their organizations. Problem resolution was clearly reactive.

MCI's new offering will radically change this situation by providing the foundation for continuous management and control of the desktop, server and network environment with its "over-the-shoulder" support service. This is made possible by the open standard selected for the new service, and by development of sophisticated management and support centers capable of resolving all problems presented by the desktop, server or network. This highly integrated technical support base will enable MCI to proactively search for and rectify problems before they become apparent to the user community.



# The outsourcing advantage

This proactive approach will lead to a considerable improvement in network efficiency and, thus, user satisfaction. Costs are reduced by eliminating the need for peer support and by centralizing the fragmented support and control facilities. MCI estimates the use of its enterprise network management offering will result in more than 99% uptime for all users. "Today's desktop business applications are absolutely critical to a company's success," says SHL's President, Technology, Bill Trafford. "That's why our goal is to provide a service that offers the highest possible degree of reliability."

## End-user support and problem resolution

MCI's offering has been specifically designed to provide the customer user community the best support in the industry. The centralized support facilities will allow for deployment of superior tools and a concentration of resources not available to the vast majority of organizations. When problems do arise, a qualified technical representative can lead the user to a solution remotely, by sharing that user's screen. If the problem cannot be solved interactively over the network, MCI will dispatch a field service engineer from the most appropriate help desk center in North America to deal with it.

Resolution is expedited through MCI's vast knowledge base and expert systems,

Outsourcing has emerged as a strategy used by many businesses to create a competitive advantage. Today, it is commonly thought of as a means of redirecting rather than replacing resources.

Many companies employ outsourcing to allocate resources more efficiently, allowing their employees to do the jobs they were hired to perform. Organizations also use outsourcing to segment functions and tasks that can be handled more efficiently by a third-party expert who has achieved economies of scale through lower cost structures and greater purchasing power.

Companies outsource to solve tactical, near-term issues and to achieve strategic, long-term benefits. According to The Outsourcing Institute, these are the top reasons companies outsource:

- They do not have access to the required resources internally. If an organization is expanding its operations, especially into a new geography, outsourcing is an alternative to building the needed capability from the ground up.
- They want to reduce and control operating costs. By accessing an outside provider's lower cost structure, which results from greater economies of scale or another advantage based on specialization, they realize greater savings.
- To contract for resources on an as-used basis rather than through capital expenditures. Outsourcing also permits an organization to redirect its resources from non-core activities to those that better serve the customer.
- Markets, competition, government regulations, financial conditions and technologies all change quickly.
   When companies outsource they gain the flexibility to meet changing opportunities.
- To immediately realize the benefits of business process reengineering by having an outside organization — one already reengineered to world-class standards — take over the process.
- By working with an outsourcing firm, a company can gain access to new technology, tools and techniques without incurring the costs of chasing technology and the training costs associated with each new generation.
- By having an outside expert assume operational details, outsourcing lets a company focus on broader business issues, such as customer needs. For many companies, the most compelling reason for outsourcing is that "how to" types of issues are siphoning off huge amounts of management's time and attention.

# The need for pre-packaged deployment and management services will soar.

with an inference engine capable of fully exploiting the information critical to solving user problems. To stay on the leading edge, this vast knowledge base is constantly kept up-to-date. The "over-the-shoulder" tool, with the user's permission, provides the ideal platform for diagnosing and resolving problems right on the user's PC. MCI also uses a sophisticated database to manage each problem ticket, guaranteeing that all problems are tracked and dealt with in a timely manner.

"End users like the concept that if anything breaks, they need to call only one number and we'll get on track to fix it immediately," says Trafford.

#### Benefits to midsized companies

Market research firms expect the need for pre-packaged deployment and management services to soar. As the number of desktop computers continues to rise, so will the number of LANs. However, LAN interconnection via a WAN is too complicated for many mid-sized companies to manage on their own. But with an enterprise network management service such as the one offered by MCI, these companies will no longer have to worry about the complexities of distributed computing. Instead, they can rely on MCI to provide the following:

 Network management, so companies can concentrate on their core competencies

- Hardware and software management to ensure compatibility and interoperability and to minimize obsolescence
- Comprehensive support designed to eliminate the hidden costs of peer support downtime, slow help desks, etc.
- Proactive network monitoring, designed to solve end-user problems remotely, before they happen or affect productivity
- "Best of breed" vendors to ensure maximum performance and reliability

 Increased productivity through improved end-user performance and satisfaction

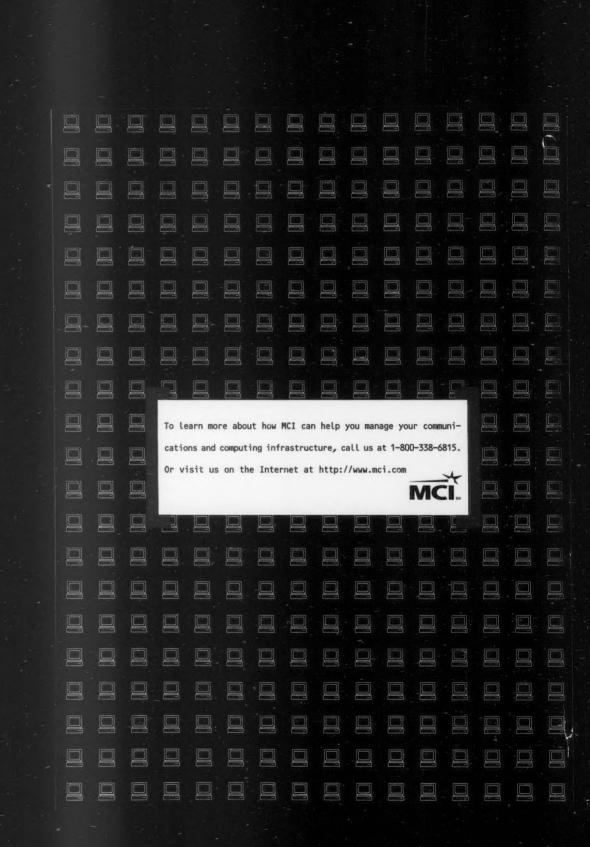
• The ability to share information

across the enterprise more quickly and easily

• Improved service to clients

Hiring outside experts to handle increasingly complex communications and computer solutions will be the rule for companies that intend to compete in the arena of tomorrow. It will allow them to achieve bottom line benefits such as performance enhancement while allowing them to concentrate on their core competencies.

The results of outsourcing



The secret's out: Object request brokers infiltrate development tools, environments, 54

# Software

# Mac Office update a year off

Users to get tighter links with Windows world

**Application** 

suites

By Lisa Picarille

hen Microsoft Corp.
updates the Macintosh version of its Office software suite
next year, users will
have much tighter integration with the Windows world,
Microsoft officials recently acknowledged.

During a private briefing earlier this

month at Macworld in Boston, Microsoft officials were tight-lipped about most everything else coming in the major update of its best-

selling suite of Macintosh applications.

Office already has all the Macintosh suites market, according to Dataquest, a market research firm in San Jose,

Macintosh users are waiting until next summer for Office 97. The Windows version will be available by year's end. But the two versions will share 80% core code, and that is important to users with mixed environments.

"Improved file compatibility is key for us because we have Office on the Mac and Windows," said John Tsombakos, a programmer/analyst at AMI Leasing Group, Inc., a car and truck company in Worcester, Mass. "We want to be able to share files seamlessly."

Microsoft officials announced the enhanced file compatibility with the Windows version but declined to flesh out the details of what Macintosh users can expect from Office 97.

On the Windows side, some of the scheduled improvements include a

souped-up version of Microsoft's Schedule+ personal information manager, the inclusion of its Internet Explorer browser, an ani-

mated form of online help called Office Assistant, a drawing program called WordArt and a streamlined command interface across all Office applications.

But Microsoft officials said the forthcoming Macintosh update of Office will be "Copland-friendly," which means it will work with the improvements that Apple Computer, Inc. plans to add to its Macintosh operating system. But Office 97 won't require a new version of the Mac OS to run, according to Dave Meltzer, group product manager for Microsoft's Macintosh applications.

Apple recently announced a strategy shift for its operating systems; the company will release Mac OS improvements every six months rather than issue a "mega-release," formerly called Copland. Because of that shift, Office 97 for the Macintosh won't fully take advantage of Copland features until further down the road.

#### **Sketchy future**

But it is unclear whether Office 97 for the Macintosh will take advantage of the improvements Apple plans to add to Harmony, a Mac OS release due in January. The improvements will include several key Apple technologies such as QuickTime 2.5, Open Transport, Open-Doc and Cyberdog.

Because many of those compete with similar Microsoft products, it is unclear what level of support Microsoft plans to offer for those products in Office 97 for the Macintosh.

Whichever road Microsoft takes, it probably won't matter much in the long run, one industry watcher claimed.

"When the largest Mac software developer ignores Apple technologies and still has a virtual monopoly" in the suites market, "you have to question just how Microsoft is the second largest developer of Macintosh applications by revenue, which was \$128.92M last year.

Microsoft and the Macintosh

Microsoft is the fourth largest developer of Macintosh applications by units sold, which was 791 million last year.

Microsoft's 1995 Macintosh applications revenue was \$200 million - 2% of the company's total revenue last year.

Microsoft ships more than 30 Macintosh software titles.

Microsoft Office for the Macintosh is the company's most popular Macintosh product.

Microsoft Office for the MacIntosh has 100% of the total MacIntosh suite market.

Source: Dataquest, San Jose, Calif.; Microsoft Corp., Redmond Wash.

important those technologies are," said Jeff Tarter, editor of "Softletter," an industry newsletter based in Watertown, Mass. "With little competition, Microsoft has no urgency to upgrade users or adopt Apple core technologies."

# SCO, HP release 64-bit Unix interface

# Users may receive server flexibility

By Laura DiDio

Calif.

SCO, Inc. and Hewlett-Packard Co. recently began to ship the initial API specification for their jointly developed 64-bit Unix operating system.

The availability of a common application programming interface (API) based on Intel Corp.'s forthcoming Merced chip set family will give businesses the flexibility to run Unix and Windows applications on any HP, SCO OpenServer and SCO UnixWare server, according to Victor Krutul, director of strategic planning

SCO and HP are working with major systems vendors to ensure full compatibility between those vendors' Unix server platforms and the forthcoming SCO/ HP 64-bit 3DA Unix operating system. Those vendors include Compaq Computer Corp., Data General Corp., ICL, Olivetti USA, Siemens/Nixdorf Informationssysteme AG and Unisys Corp.

#### The competition

But that isn't quite an industrywide initiative. There are still other versions of Unix — most notably Sun Microsystems, Inc.'s Solaris, IBM's AIX and Digital Equipment Corp.'s Digital Unix — that will compete with the HP/S/C initiative.

Jean S. Bozman, a Unix server analyst at International Data Corp. in Mountain View, Calif., said the API could ultimately make Unix a stronger platform for corporate America. But she also offered a cautionary note. The The delivery of a common API specification for 64-bit Unix will:

Ensure a common 64/32bit application base across multiple hardware platforms

Provide a compatible migration path for various versions of Unix, including HP-UX, SCO UnixWare and SCO OpenServer

Standardize on next-generation APIs to shorten application development cycles

Support the 64/32-bit Intel Merced processor family

plan "is a very complex undertaking," she said.

"And we'll also have to watch for differences in application development techniques and whether older applications will have to be modified as users migrate," Bozman added.

#### What's ahead

The first version of the API will define how the SCO/HP operating system will work with the Open Group's Distributed Computing Environment, X.11, the Open Group's Motif, and network, graphics, management and Internet services.

Future versions of the SCO/HP 64/32-bit Unix API specification will address more advanced features such as clustering and security, Krutul said.

The API will be available around the middle of next year, Krutul said.

That suits users such as Dwight Wolfe, manager of Unix systems at CNA Insurance Co.'s Personal Lines Division in Chicago. CNA has a heterogeneous environment that includes several flavors of Unix, Microsoft Corp.'s Windows NT Server and Novell, Inc.'s NetWare.

Wolfe said he would like to be able to run the same applications across all his server hardware.

SCO and HP managers said their companies are working closely with Intel to ensure that their 3DA 64/32-bit Unix systems will ship soon after Intel's Merced chip set becomes available in volume.

All told, the API "will ultimately help Unix assume its rightful role in the industry as the [operating system] that's better suited than Windows NT to run mission-critical" applications, said David Coursey, editor of "coursey.com," an industry newsletter in San Mateo. Calif.

(www.computerworld.com) AUGUST 26, 1996 COMPUTERWORLD

#### Briefs

#### **Trading bug bytes**

McAfee Associates, Inc. in Santa Clara, Calif., has licensed portions of its VirusScan and WebShield antivirus packages to Microsoft Corp. Under terms of the pact, McAfee's antivirus code will be incorporated into Microsoft's upcoming Internet software offerings, said Dave Fester, a product manager at Microsoft. The inclusion of an antiviral package in Microsoft's Internet software is important, he said, because macro viruses — the most common bug — often hide in Internet electronic-mail attachments.

#### **GammaLink kit ships**

GammaLink, a division of Dialogic Corp. in Sunnyvale, Calif., recently began to ship its Developer's Kit for Windows NT. So far nine network fax developers have adopted the software. It lets third-party vendors build GammaLink's fax board capabilities into fax applications based on Microsoft's Windows NT. The GammaLink fax boards are scalable from one to 12 ports on digital, T1 and Direct Inward Dialing interfaces.

GammaLink's Developer's Kit for Windows NT is shipping. It costs \$95.

#### X Consortium sheds duties

The X Consortium will hand over development responsibility for the X Window System technology to The Open Group, the Cambridge, Mass., organization formed earlier this year by the merger of the Open Software Foundation and X/Open Co. The X Consortium will cease engineering activities after it fulfills its role as prime contractor on a new version of The Open Group's Common Desktop Environment that integrates the Motif 2.0 user interface with X11 technology. That project is scheduled to be finished by year's end.

#### OpenStep for Solaris in beta

Sun Microsystems, Inc.'s long-promised Solaris implementations of Next Software, Inc.'s object-based OpenStep technology were released for beta testing. Full shipments of the Solaris OpenStep operating system and Workshop OpenStep development environment are due late this quarter, Sun officials said. The OpenStep software will be packaged separately from Sun's Solaris NEO object tools, but the product sets are compatible.

# Mapping package update en route

Has enhanced connectivity and programming tools

By April Jacobs

MapInfo Corp.'s latest version of its desktop mapping package includes enhanced connectivity and programming tools.

MapInfo in Troy, N.Y., will offer MapInfo Professional 4.1 on Microsoft Corp.'s Windows 95, Windows NT and Windows 3.1.x in September. It will cost \$1,295 and support Oracle Corp., Sybase, Inc. and Microsoft's Access databases.

One early MapInfo Professional 4.1 user is Berlow Real Estate, Inc. in Buffalo, N.Y., which deals with national retailers that need information about property locations.

Berlow uses the product to give clients an overview of areas that may be good for them to look into for expansion and see what the competition is doing, according to Jim Keller, MIS director at Berlow. "It's always very impressive to clients that we can ... show their competition on a map," Keller said.



Mapinfo Professional 4.1 lets users integrate data into spreadsheets and presentations

ages from Professional 4.1 to Photoshop

Users also can capture data stored in Access and store and retrieve spatial data from databases such as Sybase and Oracle.

Bruce Jenkins, a vice president at Daratech, Inc., a research firm in Cambridge, Mass., says the popularity of desktop mapping software is growing among business users as they learn to use it for analysis.

Jenkins said MapInfo's strength has been in the desktop arena; the company laimed 19.9% of the PC-based geographic information systems market last year. Competitors such as ESRI, Inc. in Redlands, Calif., have a stronger presence in the Unix workstation-based market, he added.

### Building a Data Warehouse without designMANAGER™?



### **OUCH!**

Come on, wouldn't you rather use the only multi-user conversion design tool on the market that automates the analysis phase of data warehousing? Your conversion team can work together to input all the analysis data through <code>designMANAGER\*</code> and let it produce comprehensive programming specifications for the source to target conversions.

No kidding! In the end, all of your conversion metadata is in one place where you can review it, analyze it and store it for reuse.

No pain — lots of gain!

#### VIRTUAL INTEGRATION TECHNOLOGY

Call 1-800-255-9520 or Visit our Web Site at www.vit.com/design and register for a free poster

#### Rock-solid

Berlow has used MapInfo products for several years and says more specialized thirdparty applications and additional connectivity tools make the latest version of Professional "a solid product."

MapInfo Professional lets users integrate data into spreadsheets and presentations. For example, users can export mapping im-

#### New Products

Global Village Communication, Inc. has introduced FaxWorks Server 2.0, network fax communication software for Microsoft Corp.'s Windows NT.

According to the Sunnyvale, Calif., company, FaxWorks Server 2.0 is a scalable fax communications product for small-to-midsize businesses and departments in large corporations. It lets users send faxes from any application, generate custom cover pages, merge faxes with letterhead and share telephone books — all through one interface.

Features include network administration, autoinstallation, automatic fax board detection, fax board support and extensive routing capabilities.

Pricing starts at \$2,495 for a 30-user license.

Global Village Communication (408) 523-1000 www.globalvillage.com

Smart Systems, Inc. has introduced Safe-

According to the Munster, Ind., company, SafeBoot 95 lets Windows 95 users reinstall DOS and Windows 3.1 without disturb-

ing the Windows 95 system. Users can choose to run Windows 3.1 or Windows 95 each time they reboot their PC.

SafeBoot 95 was designed to automatically recognize and install itself on most Windows configurations. It also lets users manually specify the location of DOS and Windows directories.

SafeBoot 95 requires 50M to 100M bytes of disk space for a full installation. It costs \$40.

Smart Systems

(219) 838-3000 www.smartsystems.com

F.I.T., Inc. has introduced CADvance 7.0 for Windows, two- and three-dimensional computer-aided design (CAD) software.

According to the Anaheim, Calif., company, CADvance 7.0 includes features for associative dimensioning and texturing, computation and display of object sizes, 255 colors, more than 32,000 kinds of objects, 16 line styles, drawing preview and symbol preview.

It also features eight view-only reference files and an array of information management features.

Pricing for CADvance 7.0 for Windows starts at \$1.995.

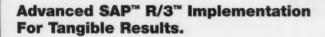
► F.I.T. (714) 956-3171 spearhead

HANGFACTURING/SUPPLY CHAIN

SERVICE MANAGEMENT

PROJECT MANAGEMENT

PLANT MAINTENANCE



Before you pursue a solution,

clearly determine the problem.

Before you settle on a program,

set concrete goals.

Before you seek a company

to implement a new system,

talk to the one company that will provide

you with tangible

results.

spearhead

SPEARHEAD SYSTEM CONSULTANTS (US) LTD.

99 SEAVIEW BLVD., SUITE 340, PORT WASHINGTON, NY 11050 voice 516.625.9000 fax 516.625.9687

e-mail spear1@interramp.com world wide web http://www.spearhead.com

SAP and R/3 are the trademarks of SAP AG.

Lock in your SAP implementation success.

- Clear Objective Establishment
- Effective Project Management
- Closed-End Work Packages
- Strict Deadline Adherence
- · Straightforward Methodology for Creating Project Paths
- Utilization of SAP Standard Tools
- Broad Portfolio of Experienced Implementation Specialists
- Focus on Tangible Results

1.888.SPEARHEAD

SAP NATIONAL IMPLEMENTATION PARTNER.

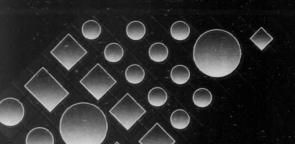
SEE US AT SAPPHIRE '96-BOOTH 405-407

# **Continuing Praise For**

Client/Server and Network Architecture Design

**Expert System-Enabled** Methodology

**Customized Project Plans** 



May 2, 1996

Marc Myers Client/Server Connection, Ltd. 103 South Bedford Rd., Suite 202. Mt. Kisco, NY 10549

I wanted to take this opportunity to let you know how impressed we are with the CS/10,000. Hene Gregorian showed us the product just a few weeks ago and already we are looking into implementing the tool in four different MIS Departments here at CBS. CS/10,000 verifies the most recent client/server architectures, as well as detailed project

C5/10,000 vermes the most recent chemi/server and analysis. We were able to automatically generate:

- client/server diagrams specific to our project cuent/server chagrants specific to the detailed work breakdown structures

- numerous product configurations

We saw the value of CS/10,000 immediately and are excited to work with the tool both in the New York and Los Angeles offices. I look forward to doing business with you and your staff of Client/Server Commercian. at Client/Server Connection.

Moth

Broadcast Center MIS

May 8, 1996

Client/Server Connection, Ltd. Mr. Dan Horton 103 South Bedford Rd., Suite 202 Mt. Kisco, NY 10549

We in the Technical Systems Support group at Amtrak just completed our first full-lifecycle project plan to build a data warehouse. We used the CS/8,000 software you sold us as the backs fore back definition. We also used fixth 0000 to draft a reminer rise to the definition. project plan to build a data warehouse. We used the CS/8,000 software you sold us as the basis for task definition. We also used CS/8,000 to draft a project plan to establish the infrastructure for data warehousing by purchasing a server, data base management system, and data warehouse access and management tools Dear Dan:

During these efforts I appreciated the support I got from you and the CSC support staff via the help line, most notably from Scott Chin. When I encountered difficulty in installing the product at 6 nm on a Saturday. I was entire automiched to have my call to the help line. and data warehouse access and management tools. the neip line, most netably from Scott Chin. When I encountered difficulty in installing product at 6 pm on a Saturday, I was quite astonished to have my call to the help line associated. With Cryst's help. I maniful replacements constants. product at 6 pm on a Saturday, I was quite astonished to have my call to the help line answered. With Scott's help, I received replacement contents for a defective diskette via the Interest, and had the product operational by Monday, noon. I have also appreciated your leaking with me periodically to make sure I had what I needed, and for offering and following through on sending me document tempelates in WordPerfect forms cnecking with me periodically to make sure i had what i needed, and for offeri following through on sending me document templates in WordPerfect format.

We have not yet evaluated the clien/server development side of CS/8,000, but I look We have not yet evaluated the chent/server development side of C5/8,RAN, but 1 fook forward to your continued fine support and follow-through as we undertake future projects.

Mullane

(Ms.) Jeanne P. Mullaney Acting Manager, System Standards and Operating Practices (Ms.) Jeanne P. Mullaney

"[CS/10,000] gives companies a way to build a project plan on something besides their own experience without having to invest in a critical mass of skilled experts."

- Richard Hunter, Research Director - Gartner Group, Inc.

"Having just completed a project ... I have tremendous appreciation for a tool that can offer the benefits that CS/8,000 offers."

- A. Wallace Eckstein. Manager, Employee System Support Westinghouse Electric Corporation

The Software is the Solution

# CS/8,000 and CS/10,000...

**Product Selection** 

**Neural Network-Based Project Estimator** 

> **Automated Project** Documentation



NATIONAL PARK SERVICE P.O. Box 37127 Washington, D.C. 20013-7127

June 6, 1996

Marc Myers Client/Server Connection, Ltd. Marc Myers Client/Server Connection, Edd. 103 South Bedford Rd., Suite 202 Mt. Kisco, NY 10549

Dear Marc:

The National Park Service (NPS) is the caretaker of the American's heritage. Whether The National Park Service (NPS) is the caretaker of the American's heritage. Whether it is our nation's White House, a back-country section of the John Muir trails, the historic mission at Tumacacori National Historic Site, or a "wetlands" control facility set up to protect an endangered species at Everelades National Park. each is planned as the protect an endangered species at Everelades National Park. nissone mission at lumacacori National Historic Site, or a "wetlands" control facility, set up to protect an endangered species at Everglades National Park, each is planne and cared for with the same empleacionalized by the Dark Species facilities and cared for with the same empleacionalized by set up to protect an endangered species at Everglades National Park, each is and cared for with the same professionalism by the Park Service facilities spe

In addition to our National heritage resource responsibilities, the Park Service is In addition to our National heritage resource responsibilities, the Park Service is accountable for other resources. The 8,000 miles of roads, 1,400 bridges & tunnels, the 1,500 water/or the 1,500 water of the 1,500 water

Recently, the Service initiated a very complex study to identify its facilities management informations requirements. This study will analyze the Program's informations issues, needs and alternatives in an effort to determine how to better support the NPS Facilities Management Program. This study will evaluate and recommend an information architecture that will effect the preservation and care of our most cherished National resources.

In support of this project, the Park Service has decided that Client/Server Connection's color to this project, the Park Service has decided that Client/Server Connection's color to the project, the Park Service has decided that Client/Server Connection's color to the project, the Park Service has decided that Client/Server Connection's color to the project, the Park Service has decided that Client/Server Connection's color to the project, the Park Service has decided that Client/Server Connection's color to the project, the Park Service has decided that Client/Server Connection's color to the project, the Park Service has decided that Client/Server Connection's color to the project, the Park Service has decided that Client/Server Connection's color to the project to the park Service has decided that Client/Server Connection's color to the project to the park Service has decided that Client/Server Connection's color to the park Service has decided that Client/Server Connection's color to the park Service has decided that Client/Server Connection's color to the park Service has decided that Client/Server Connection to the park Service has decided that Client/Server Connection to the park Service has decided that Client/Server Connection to the park Service has decided that Client/Server Connection to the park Service has decided that Client/Server Connection to the park Service has decided that Client/Server Connection to the park Service has decided that Client/Server Connection to the park Server Connection to In support of this project, the Park Service has decided that Client/Server Connection's C5/10,000 expert-based software is the best engineering tool to assist in the analysis of its complex information architecture. Not only will C5/10,000 facilitate the analysis activities, it provides exceptional tools for documentation and project management. The Park Service's success with the Facilities Management Information Study will depend greatly on Client/Server Connection's C5/10,000 software. The Park Service's success with the Facilities Management Informat depend greatly on Client/Server Connection's CS/10,000 software.

Will Brimberry Will Brimberry, Project Manager Facilities Management Program Information Study National Park Service

Please contact us

to request free product literature for CS/8,000 and CS/10,000, in addition to glowing industry reviews and accolades for the entire CS family of products.

Call us at: (914) 241-9100 or fax: (914) 241-7878 On the Web at: http://www.cscl.com



DEPARTMENT OF THE AIR FORCE



August 12, 1996

Ms. Heather Zeigler Client/Server Connection, Ltd. 103 S. Bedford Rd., Suite 202 Mt. Kisco, NY 10549

Thank you for a very enlightening presentation on your product CS/10,000 and providing the organization with the competituity to with the competit Thank you for a very enlightening presentation on your product CS/10,000 and providing my organization with the opportunity to witness a product that will definitely add innumerable values to the development of client/server systems. Dear Heather,

Genutery and influence values to the development of Some of these values germane to my organization were

- Immediate availability of expert knowledge when the organization needs, uniformly be recent to promotion operations as extended the committee of the commi without having to resort to expensive consultants outside the organization; Architecture-driven appearance that succeed appearance to the consultants of the state of the stat without having to resort to expensive consultants outside the organization;
  Architecture-driven approach that would encourage to first think about the
  "big picture" before jumping into details;
  Automatic generation of a moject plan based on the architecture, which the
- Automatic generation of a project plan based on the architecture, which the
   project manager can use to estimate unadded and architecture.
- Autumnant: generation or a project pian based on the architecture, which it project manager can use to estimate workload and resources needed as used so teach properties. well as track progress;

  • Tight integration with numerous DoD standards, in particular MIL-STD-498;

  • Company for Coffession Unringering Tractifety of SCITI Completitive Materials, Made Tight integration with numerous DoD standards, in particular MIL-STD-498;
   Support for Software Engineering Institute's (SEI) Capability Maturity Model (CMM) for Software integrated into CS/10,000's development methodology.

Hook forward to working with your product and building a close busine Hook forward to working with your product and building a close business relationship between your company and my organization. Wish you and the company a continued success on future endeavors!

Figur Mun Roger H. Moon, Captain, USAF Chief Systems Architect, Air Staff Systems Directorate Air Force Pentagon Communications Agency

Domestic and International reseller inquiries are cordially invited.

We are Client/Server Connection, Ltd.



# Vendors pull the cloak off object request brokers

By Frank Hayes

It wasn't long ago that object request brokers were every bit as obscure as their name.

An object request broker (ORB) is middleware that serves as a traffic cop for object-oriented distributed software on a network.

That ORBs across a distributed software on Diect tools

The ORB routes
messages among objects, so developers don't have to worry
about where on the network each
piece of software resides. But only
large organizations that have distributed applications have needed
ORBs — or even know what

"Object technology is a big corporate secret today," said Zev B. Lavon, a consultant at RBS Consulting in Baltimore. "People have to build it themselves now."

That is partly because using ORBs to connect applications across a network has been technically difficult.

Progress on stan-

The Object Management Group, a vendor and user consortium in Framingham, Mass., is developing a set of standards called the Common Object Request Broker Architecture (CORBA). But it has had a tough time persuading members such as IBM, Digital

Equipment Corp. and Sun Microsystems, Inc. to work together to adopt the standards. Without these standards, development tool vendors have been slow to support ORBs.

Vendor pacts

But now tool, Internet and object technology vendors are actively looking for ways to make ORBs easier for corporate developers to use. IBM and Sun last week said they will work together to ensure that their tools and ORBs will work together.

The agreement follows a similar deal in May among IBM, Apple Computer, Inc. and Iona Technol-

gies Ltd. in Dublin.

Some development tool vendors, including Powersoft Corp., are also working to link desktop applications to CORBA networks. Powersoft is working with Iona on ways to let applications built with the PowerBuilder visual development system easily include an ORB.

And Open Environment Corp. in Boston, which will soon merge with Borland International, Inc., plans to add an ORB to its middleware by year's end.

Netscape Communications Corp. last month announced it will add an ORB to the next versions of its Navigator World Wide Web browser and SuiteSpot Web server. That will put ORBs on millions of users' desktops by this time next year.

### More apps

But some corporate developers want even more applications to come with CORBA-compatible interfaces — especially largescale applications.

"That's exactly the message we want to be sending to vendors, that we won't accept proprietary interfaces into their products," said Carol Burt, technical director at BellSouth Corp. in Birmingham, Ala. "We want these to be open systems."

# Assuming the Lotus position

### Third-party vendors develop support for Domino | Acti

Just add water

Instant I-Net includes these

intranet applications

Company phone directory

information and policy manuals)

Reference knowledge base

Human resources library

(job postings, benefits

Document repository

Discussion forum

By Tim Ouellette

they are.

Third-party software vendors are starting to deliver development and other kinds of tools for Lotus Development Corp.'s integrated Notes/Web server called Domino.

Domino is a Notes server module that natively supports the Internet's Hypertext Transport Protocol and Hypertext Markup Language protocols. As a result, Notes servers can act as World Wide Web serv-

ers, and users have the option of accessing Notes data from a Web browser.

InfoImage, Inc., a Notes developer and integrator in Phoenix, is shipping Instant I-Net, a suite of application templates (see chart) that the vendor claims lets users get Domino-based intranet applications up and running faster than if they developed their own programs.

### Central help desk

Meanwhile, Brainstorm Technology, Inc. in Cambridge, Mass., this week will announce Virtual Help Desk for Notes. This is help desk software that lets users log service requests to information systems managers via a Web browser, using Domino as the management engine.

The applications are important because there won't be company-specific business gains with Internet use unless users combine the Web with applications such as Notes, analysts said.

"It is one thing to drop a browser on everyone's desktop and set up a home page and think you have instant productivity," said Gerry Murray, an analyst at International Data Corp. (IDC) in Framingham, Mass. "You really need the discipline of something like Notes [and Domino] — with forms, data, etc. — to make the Internet relevant for business productivity."

Users can expect a lot more where this came from.

An IDC survey completed earlier this month found that 95% of Lotus' 12,000 busi-

ness partners expect to provide some sort of service related to Domino. These include integrating Web pages with Notes databases, using Notes as a Web publishing tool, creating Internet/intranet bridges and extending legacy

One user on the Instant I-Net discussion group at www.infoimage. com saw the possibilities that Web and Notes inte-

gration could bring. "I have been recently pushing Domino as our intranet solution" to little avail, he said. "After management saw what was possible with Domino and Instant I-Net, they all of a sudden started to really pay attention to me."

InfoImage plans to deliver other plug-in intranet applications later this year.

Virtual Help Desk lets geographically distributed companies have one central help desk. IS staff can then make the company's IS knowledge base — stored as a Notes database — available to users over the Web. Instant I-Net costs \$995 per Notes server. Virtual Help Desk costs \$7,200 per server for an unlimited number of users.

### ActiveX components ease Notes customization

By Sharon Gaudin

Users have six new ways to customize Notes thanks to a set of software applets Lotus Development Corp. recently announced.

One user said this is a hot release. But an analyst said Notesspecific components can be a major drawback.

Cambridge, Mass.-based Lotus started shipping a set of ActiveXbased software applets two weeks ago. The Lotus Components Starter Pack includes six core components. A component is a reusable software "chunk" that can

be loaded into an end user's Notes setup and serve as a mini-application.

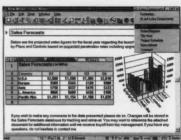
The Notes menu will contain six components — chart, comment, draw/diagram, file viewer, project scheduler and spreadsheet — and a template builder.

### Product boost

"The components are the type of thing that makes Notes a robust application," said James Wilcoxon, CEO of Rockville, Mass-based Wilcoxon Construction Co., which installs commercial swimming pools. "You have a menu sitting up there, and if you want to compose a chart or something, you don't have to leave Notes."

But David Yockelson, an analyst at Meta Group, Inc., said although the components will save Notes users time, they can't be used outside of Notes — at least not yet. If an end user wants to use the new components, he must run Notes.

"It's a good start," Yockelson said. But "it's limiting, at least at first, because you're locked in to Notes. Notes users won't be put off, obviously," he said.

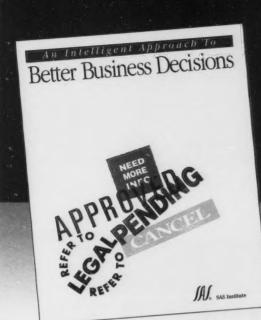


Lotus Components Starter Pack, a collection of six core components, may make Notes more robust

The components are for only 32-bit platforms that run on Windows 95 and Windows NT. Peter Cohen, component product manager at Lotus, said the company is focusing on moving the components to other platforms, specifically the major Internet browsers, within a year. Lotus also is worting on a few more components, including one for data querying, Cohen said.

Sandy Taylor, an analyst at The Standish Group International, Inc. in Dennis, Mass., said making the components available to Notes users will empower computer-savvv workers. "A lot of folks are computer literate, [and the components] give them a leg up" because they are able to customize and thus more effectively use Notes applications, she said. Lotus components may make life easier for IS managers who have to do the purchasing and integration. "If I have a choice of taking a product from Company A and a product from Company B, as opposed to buying two from one company, guess which one I'm going to pick," Taylor said. "If they're already using Notes, it's an easy choice.'

COMPUTERWORLD AUGUST 26, 1996 (www.computerworld.com)



Yours Free for a Limited Time

# An Intelligent Approach to Better Business Decisions

Find Out How SAS Institute Makes
It Easier Than Ever to Reach the
Right Decisions...for Your
Business and Your Budget.

Making the right decisions is your business. Making them easier is ours. We're SAS Institute, the recognized leader in decision support solutions.

From providing immediate access to more than 50 databases and file formats, to turning raw data into real information using a full spectrum of applications, you'll find SAS software is your complete Business Intelligence solution.

- On-Line Analytical Processing (OLAP)
- Enterprise Information Systems (EIS)
- Decision Support Systems

SAS Institute puts it all together in one package, complete with menu-driven interfaces to make it all quick and easy.

And, since our software works the same across all your hardware, you won't have to purchase and support single-shot software packages that weren't designed to work together in the first place.

### For Your Free Guide, Just Give Us a Call.

We believe every Business Intelligence solution should provide applications breadth and depth... a consistent interface to all your business data... client/server capabilities... and portability across all your hardware.

You'll find alf that and more in software from SAS Institute. But first, we invite you to find out the facts for yourself in our free introductory guide... containing insights from SAS Institute, our software users, and leading publications.



Simply call our World Headquarters now at 919.677.8200 or send us E-mail at **cw@sas.sas.com** 

Visit us at Booth #113 at DATABASE and CLIENT/SERVER World.



### **SAS Institute**

Phone 919.677.8200 Fax 919.677.4444 In Canada 1.800.363.8397

For Dates and Locations of Free SAS Seminars, Visit Us on the World Wide Web at http://www.sas.com/

SAS is a registered trademark of SAS Institute Inc. Copyright © 1996 by SAS Institute Inc. The world's best color ink jet printer. Right here in black and white. And-

Yellow.



### THE EPSON STYLUS PRO.

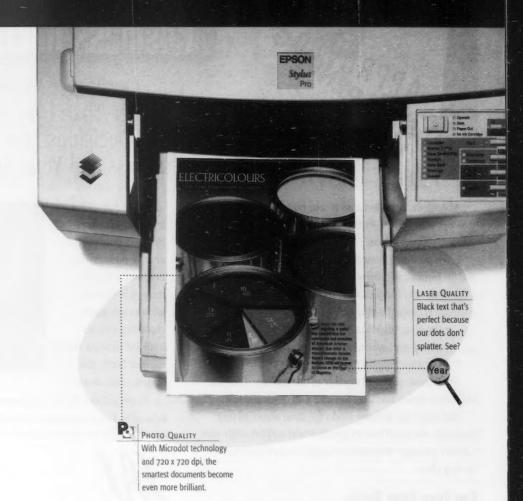
What makes it the world's best? True 720 x 720 dpi and Microdot technology for dazzling Photo Quality color and crisp laserquality black text. Advanced Piezoelectric technology for a clean, consistent printed dot. Exclusive optional internal Ethernet and Adobe' PostScript' Level 2.

STYLUS PRO Cross-platform compatibility with PC, Macintosh and UNIX.

720 x 720 dpi on plain paper. Network connectivity with Ethernet & LocalTalk.

And compatibility with all Windows applications, NT, Mac, and OS/2. For about \$389. To find out more, set up a product demo, or receive a brilliant color print sample, just call our corporate hotline.

CALL 1 800 420-2470 ASK FOR OPERATOR 3400

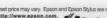


YOU'VE GOT TO SEE IT IN



COLOR:







Save over 73%

trade C1

Yes, I want to receive my own copy of COMPUTERWORLD each week. I accept your offer of \$39.95\* per year - a savings of over 73% off the single copy price.

First Name	М	Last Name			
Title	Compe	ny			
Address	City	State Zi	p		
Address Shown: Thome Business New	☐ Renew Single copy price: \$3.00/issue	*U.S. Only. Canada \$95, Mexico, Central/South Am	nerica \$150, Europe \$295,	all other countr	ies \$29
	Please comp	ete the questions below.			
BUSINESSAMOUSTRY (Circle one) 10. Menufiniturer (other than computer) 10. Menufiniturer (other than computer) 10. Menufiniturer (other than computer) 10. Menufiniturer 10. Menufiniturer 10. Menufiniturer 10. Business Service (except DP) 10. Government - State/Finiteral/Local 10. Communications systemm/Public	TITLE/FUNCTION (Circle one)     ISABSIDP MANAGEMENT     Orbiel information Officer/Vice     President/ Aust. VP IS/MIS/DP     Meragement     Dir/Mgr, Mill Services, Information     Center	12. Vice President, Asst. VP 13. Tressurer, Controller, Financial Officer DEPARTMENTAL MANAGEMENT 51. Sales & Midg, Management 70. Medical, Legal, Accounting Mgt, OTHER PROFESSIONAL MANAGEMENT 80. Information Cantery/Libration.	4. How many people an location and in your including all of its bra and subsidiaries? (Se per column.)	ntire organizati nches, divisions elect only one 1. At this 2.	ion,
Utilities/Transportation 70. Mining/Construction/Petroleum/ Refining/Agriculture	<ol> <li>Dir./Mgr. Network Sys., Data/Tele.</li> <li>Comm., LAN Mgr. /PC Mgr., Tech Planning, Administrative Services</li> </ol>	Educators, Jcumalists, Students 90. Other Titled Personnel	A. 20,000 ÷ B. 10,000 –19,999	0	0
<ol> <li>Menutacturer of Computers, Computer-Related Systems or</li> </ol>	<ol> <li>Dir Mgr. Sys. Development, Systems Architecture</li> </ol>	<ol> <li>Do you use, evaluate, specify, recommend, purchase: (Circle all that apply)</li> </ol>	C. 5,000 - 9,999 D. 1,000 - 4,999	0	0
Peripherale 85. Systems Integrations, VARs, Computer Service Bureaus, Software Planning &	<ol> <li>Programming Management, Softwar Developers</li> <li>Engineering, Scientific, R&amp;D,</li> </ol>	(a) Solaris (e) Mac OS (b) Netware (f) Windows NT	E. 500 - 999 F. 100 - 499 G. 50 - 99	000000	000
Consulting Services  90. Computer/Peripheral Dealer/Dist./ Retailer	Tech. Management 60. Sys. Integrators/VARs/Consulting Mg CORPORATE MANAGEMENT	(c) OS/2 (g) Windows (L (d) Units (h) NeXTstep App Development Products (T) Yes (T) No	H. 20-49 J. 10-19 K. 1-9	000	000

COMPUTERWORLD

Everything you need to know.

Save over 73%

B486 3

B486 3

Yes, I want to receive my own copy of COMPUTERWORLD each week. I accept your offer of \$39.95\* per year - a savings of over 73% off the single copy price.

First Name	MI		Last Name	0				
Title		Compa	ny					-
Address Address Shown: ☐ Home ☐ Business ☐ N	ew 🗇 Renew	City Single copy price: \$3.00/issue	State *U.S. Only. Canada \$95, Mexi	Ziç ico, Central/South Am		0. Europe \$295. a	all other coa	— untries \$29
			ete the questions			.,		
BUSINESS/MDUSTRY (Circle one)  10. Manufacture (other than computer)  20. FinenconfinearmoniPlead Estate  30. Medical/Law/Education  40. Windowsle/Fletal/Trade  50. Businese Service (except DP)  60. Government - State Federal/Local	19. CI Pi	/FUNCTION (Circle one) S/DP MANAGEMENT hief Information Officer/Vice resident/ Asst. VP IS/MIS/DP anagement tr/Agr. MIS Services, Information	<ol> <li>Vice President, As</li> <li>Tressurer, Controli</li> <li>DEPARTMENTAL, MA</li> <li>Sales &amp; Midg, Ma</li> <li>Medical, Legal, A</li> </ol>	ler, Financial Officer  ANAGEMENT  anagement  coounting Mgt.	loc inc and	w many people an ation and in your a luding all of its bra d subsidiaries? (So r column.)	intire organi riches, divis elect only or	ization, sions
Government - State/Federal/Local     Communications Systems/Public     Utilities/Transportation     Mining/Construction/Petroleum/	22. D	enter ir/Mgr. Network Sys., Data/Tele. omm., LAN Mgr. /PC Mgr., Tech	OTHER PROFESSION 80. Information Cents Educators, Journ 90. Other Titled Pena	ers/Libraries, elists, Students	A	20,000 +	location	Organiza
Refining/Agriculture 80. Menufacturer of Computers, Computer-Related Systems or	23. D	lanning, Administrative Services ir://Agr. Sys. Development, ystems Architecture	3. Do you use, evaluate, mend, purchase: (Cir	specify, recom-	B. C. D.	10,000 -19,999 5,000 - 9,999 1,000 - 4,999	0	
Peripherals 85. Systems Integrators, VAPIs, Computer Service Bureaux, Software Planning &	D	rogramming Management, Softwan evelopers ngineering, Scientific, R&D,	Operating Systems     (a) Solaria     (b) Netware	(e) Mac OS (f) Windows NT	E.	500 - 999 100 - 499 50 - 99	5	3 0
Consulting Services  90. Computer/Peripheral Dealer/Dist/	Te	ech. Management	(c) OS/2	(g) Windows	H	20 - 49		

BUSINESS REPLY MAIL
FIRST CLASS MAIL PERMIT NO. 55B MARION, OH 43306

POSTAGE WILL BE PAID BY ADDRESSEE

COMPUTERWORLD
P O BOX 2044
MARION OHIO 43306-4144





**BUSINESS REPLY MAIL** 

FIRST CLASS MAIL PERMIT NO. 55B MARION, OH 43306

POSTAGE WILL BE PAID BY ADDRESSEE

COMPUTERWORLD

P O BOX 2044 MARION OHIO 43306-4144 NO POSTAGE NECESSARY IF MAILED IN THE UNITED STATES



Network management tool vendors integrate with Tivoli Management Environment, 58

# The Enterprise Network

# Mobile agreement

Wireless carriers' billing accords further CDPD

By Mindy Blodgett

Another piece in the CDPD puzzle fell into place in recent months as most of the major carriers signed interoperability agreements.

Those agreements allow users to roam among coverage areas easily.

Analysts and industry observers said the agreements are an important step in moving along the implementation of Cellular Digital Packet Data (CDPD), which supports short, bursty transmissions via the Internet Protocol-based wireless packet technology.

The interoperability agreements with make CDPD more attractive to users who seek to use wireless data communications between cities or regions. Customers can now use wireless data devices to send electronic mail or short messages between areas with CDPD coverage without worrying about billing or needing different modems.

"The big news lately with CDPD is definitely the interoperability agreements," said Roberta Wiggins, an analyst at The Yankee Group in Boston. "The major carriers are pretty much hooked up which does bring us closer to some kind of nationwide communications capability."

Wireless carrier, page 58

CDPD  ○ = Agreements made	_		or CDP	D
carriers for interbilling	has per	inter	norsh	dilib
Areas of Special Coverage	Mai Willed	OTE MOD	Winet He	Manuel
Ameritech		•		
Chicago     Detroit/Ann Arbor, Mich.     Gary/Hammond, Ind.     East Chicago, Ind.     St. Louis	:			
AT&T Wireless		7 8	•	
New York Daltas/fort Worth Miami/fort Lauderdale Seattle/Everett, Wash. Minneapolis/5t. Paul Pittsburgh Portland, Ore. San Antonio Salt Lake City Las Vegas				
GTE Mobilenet	•			E
San Francisco/ Oakland, Calif. Cleveland Tampa/ St. Petersburg, Fla. San Jose, Calif. Louisville, Ky. Richmond, Va., Raleigh/Durham, N.C.		-		
Bell Atlantic				H
Nynex Mobile		-		
Philiszleit mia     Boston/Lowell/ Brockton, Mass.     Washington     Pittsburgh     Baltimore     Phoenix				
Several cities     in Connecticut	13	3		

# MCI links data/voice network to Mexico after monopoly ends

By Kim Girard

U.S.-based multinational companies that do business in Mexico now have access to a unified data and voice network that links the two countries.

Avantel, a joint venture between MCI Communications Corp. and Mexico's largest bank, Grupo Financiero Banamex Accival, this month unveiled a 3,400-mile fiber-optic network that links MCI users in the U.S. to a nearly identical network in Mexico.

MCI is the first long-distance carrier to offer switched long-distance service in Mexico, which just passed a law that allows competition with the 47-year-old long-distance monopoly, Telefonos de Mexico (Telmex). Before the breakup of the monopoly, providers were forced to offer services over dedicated circuits leased from Telmex.

Avantel offers customers services that include private lines, X.25 packet networks, frame relay, dedicated access to the Internet and public fax service.

Sue Taylor, manager of telecommunications and office automation at Norand Corp., a mobile computer maker in Cedar Rapids, Iowa, said the company is considering using Avantel to link a sales site in Mexico City to headquarters via a framerelay link. Employees at the site currently dial in orders to Iowa.

Frame relay should be less expensive MCI, page 58

No standards, no products, but lots of hype

# Gigabit-gaga

By Bob Wallace

ven though vendors have been racing to develop products for the latest high-speed LAN switching option, Gigabit Ethernet, users are wary of the nascent technology.

The din of the Gigabit Ethernet marketing drums has tended to drown out the fact that there are no standards, products aren't due until at least year's end and Asynchronous Transfer Mode (ATM) offers more capabilities.

Users said Gigabit Ethernet, which operates at 1G bit/sec., promises a means to handle increasingly heavy traffic loads in backbone networks. But they don't see it as the big rival to ATM that it has been made out to be.

"Gigabit Ethernet is certainly something most everyone will eventually be able to grow into, but ATM is much more versatile. And although it may end up costing more, it has capabilities that Gigabit Ethernet lacks," said John Boyd, chief networking technologist at Northeast Utilities, Inc. The Berlin, Conn., power company uses an ATM network that can handle voice, data and video traffic

Gigabit Ethernet lacks quality of service functionality, which lets users set different priorities for sending voice, data and video and which

guarantees bandwidth for those transmissions. Ethernet technology was designed for data and can't guarantee performance for data and video when they run simultaneously at high speed.

But to Gigabit Ethernet's credit, users see it as promising. That's because it gives users a migration path from shared Ethernet to switched Ethernet to Fast Ethernet to gigabit speed. And that's good news for Ethernet users who want to support more bandwidth-intensive data applications without painful upgrades.

Users will get their first good look at Gigabit Ethernet products at Networld/Interop '96 next month in Atlanta.

Users can expect to see Gigabit Ethernet adapter cards, which they can use to connect to servers, and Gigabit Ethernet modules that will enable high-end data center switches to pass lower-speed traffic on to Gigabit Ethernet backbone networks.

Gigabit Ethernet pricing is still up in the air, as is a standard for the technology — on which the Gigabit Ethernet Alliance, a vendor association, is hard at work.

Some users are cautiously optimistic about the fledgling technology, but they do have several concerns.

"Gigabit Ethernet is a great idea, but my fear is that expectations will be unreasonably high," said a network manager at an East Coast university. "Just because products will ship doesn't mean that everything will be



John Boyd of Northeast Utilities: Gigabit Ethernet may be less expensive than ATM, but it isn't as versatile

in place to handle the bandwidth," she said, referring to cabling, drivers for major operating systems and any changes that must be made to switches.

Another user concern is how firms will tie together Gigabit Ethernet campus networks over the wide area. "Right now, all the carriers are focused on ATM [wide-area network] services but don't have an interface for Gigabit Ethernet." Boyd said.

Nonetheless, research firm Dataquest in San Jose, Calif., is bullish on the technology. Dataquest recently predicted that worldwide sales of Gigabit Ethernet products will reach \$2.9 billion by 2000.

# Network tool vendors team up for integration

No longer can any single plat-

form overcome the complexity of managing distributed environ-

ments, Price said. Instead, users

should determine their manage-

ment requirements, choose

matching tools and integrate

By Patrick Dryden

Administrators of complex networks are tired of trying to make all their favorite management tools work together. They prefer to see key vendors handle the integration for them.

That wish is coming true for organizations adopting the Tivoli Management Environment (TME 10), a leading systems management suite and framework for taming huge networks.

Key tool vendors met recently in an effort to make their software work with TME 10 as part of a unique vendor partner program launched by Tivoli Systems,

Inc., which IBM acquired to focus and lead its management software efforts.

The venture differs from similar efforts by competitors and the pre-Tivoli IBM because it takes a standards-body approach that promises a more open process than typical vendor-led integration programs.

Through nine working groups, the members of the 10/Plus Association are defining the interfaces that enable complementary and even competitive management products

to communicate

That means a TME 10 user could choose event-handling soft-ware, for example, from members such as Boole & Babbage, Inc., Maxm Systems Corp. or Tivoli and be sure the tool could pass network alerts to the trouble-ticketing module from Tivoli or another member.

"Typically, one vendor pushes its own integration standard, or consortiums try and fail miserably. This is a gentleman's agreement among a core group of competitors to create workable interfaces," said Clare Price, research director at Gartner Group, Inc. in Stamford. Conn.

An aid to users

Tivoli's approach would help Wells Fargo & Co. in San Francisco, whose staff selects "best-ofbreed tools" to manage systems and networks but struggles to make them work together, said Peter Martin, vice president of enterprise automation.

"Right now, we have to determine if we can link a platform like Tivoli's with other products and build the bridges ourselves. We prefer to see individual products architected openly to work together easily so we can automate management functions through fewer consoles," Martin said.

TME 10 user Charles Schwab & Co. in San Francisco hopes to see more vendors supply out-of-the-box support of basic communication among their tools, said Dave Kessell, vice president of infrastructure proiects.

"No single vendor can do it all," Kessell said.

For NationsBank Corp. in Charlotte, N.C., a key attraction of

TME 10 is its support of tools from leading vendors, said James Brown, senior vice president of network platforms.

"We hope to just plug tools into one framework so we can paint the overall picture of the network and systems to be managed," Brown said.

Tivoli's independence has improved IBM's ability to recruit partners, said Jack Brown, senior director of distributed systems at association member Boole & Babbage in San Jose, Calif.

Tivoli's approach will result in quick benefits to users, said Sue Aldrich, senior consultant at Patricia Seybold Group in Boston.

"Here the participants can define a management specification that's reasonably practical for each of them to implement quickly," she said

"Users will continue to need multiple tools, but TMEcertified applications will at least exchange information," said Tim

Wilson, management analyst at Decisys, Inc. in Sterling, Va.

"Then maybe they won't have to boot 11 different consoles to find the answer to one question," Wilson said.

### Streamlining the process

Tivoli is copying the approach of standards bodies to help management tool vendors adapt their products to its systems management framework. Here's how it works:

- Tivoli and vendors of complementary or competing products form working groups, such as one for network tools.
- 2. Members, including 3Com Corp., Bay Networks, Inc., Cisco Systems, Inc., Novell, Inc., SunSoft, Inc. and Tivoli, met in June and again this month.
- 3. They are defining a basic application programming interface for passing network alerts and data through TME 10.
- Tivoli tests and certifies products for interoperability.

### MCI links data/voice to Mexico

The TME team

10/Plus Association

members include BMC

Software, Inc., Candle

Corp., Compag Com-

puter Corp., Legato

Systems, Inc.,

Platinum Technology,

Inc. and Sun

Microsystems, Inc.

CONTINUED FROM PAGE 57

and is more reliable, Taylor said. "The frame cost is going down," she said. "I personally think it needs to go down more."

Gary Davis, manager of data and wide-area networking at a Houston-based computer firm that has sales and marketing offices in Mexico, said the company also plans to use Avantel's framerelay service.

"It will lower our costs to do business in Mexico," Davis said. "I do see 5% to 10% savings. I hope to see improved responsiveness, reliability and quality."

Although frame-relay connections are linked across the border, many U.S. companies with manufacturing plants in Mexico don't need them yet, according to one analyst.

Tom Nolle, president of CIMI Corp., a consultancy in Voorhees, N.J., said many corporations consider manufacturing plants the equivalent of their U.S. remote offices and demand little more than Internet access to exchange electronic mail. That may change if business traffic increases dramatically and a uniform data communications system becomes necessary.

"If [the North American Free Trade Agreement] creates a North American manufacturing megaplex, that megaplex will have to have uniform communications," Nolle said. "It's doubtful we'd be able to compete without them. [But] I don't think it's going

to be a factor for another two to three years."

MCI has already linked its HyperStream frame-relay service to networks in Canada through agreements with carriers there.

About 200 U.S.-based corporations are potential customers for cross-border network service, said Richard Perez, a senior engineer at MCI who works on the Avantel project.

### Wireless carriers' agreements

CONTINUED FROM PAGE 57

The latest agreement came last month when GTE Mobilenet, Inc. and AT&T Wireless Services agreed to interconnect the billing for their wireless data networks. That will enable customers to send and receive data regardless of their location within each carrier's coverage area. The pact will affect 65 million potential users in 34 markets across the country. It will take effect in October.

Other major carriers, including Ameritech Cellular Services and Bell Atlantic Nynex Mobile, signed interbilling agreements during the course of the past year.

Making it easier for users to roam between service areas by facilitating the billing system is an important step to speeding along implementation of CDPD, which hasn't caught on as expected. The interbilling agreements are key, but they are just one element needed for CDPD to catch fire, according to industry analysts.

"This is an important factor, but there are others, like applications and cost-effective end-toend solutions and awareness, needed for acceptance of CDPD," said Dan Merri-

man, an analyst at Giga Information Group in Cambridge, Mass.

Officials at the carriers said they hope that with interbilling agreements in place, they can begin to attract the office users who have so far stayed away from the technology. Mobile professionals are more interested in nationwide wireless capabilities, according to industry analysts, and the interoperability agreements make nationwide service more of a reality.

In the meantime, users in vertical markets, including public safety agencies and utilities, are increasingly signing on to the technology.

Angel Rivera, a communications engineer at Columbia Gas and Electric in Pittsburgh, said the utility uses CDPD technology to monitor energy usage and ensure correct pipeline pressure and flow rates during energy demand peaks. Columbia Gas uses Bell Atlantic Nynex Mobile's CDPD service to transmit information from measuring points

throughout its system to its local substation computer in Bethel Park, Pa., and then

Park, Pa., and then to its monitoring center in Columbus, Ohio.

Mobile

communications

"We are getting the same performance we got when we used leased [telephone] lines, and it's more cost-effective," Rivera said of the technology. "And we only needed to make minimal software changes."

In San Francisco, Yellow Cab Cooperative, Inc. uses CDPD from GTE Mobilenet to verify credit-card transactions in cabs. Yellow Cab has been testing the technology in five cabs and will expand the pilot to 25, according to general manager Nate Dwiri. "It works pretty well. We've had a few hangups but nothing major," he said.

### South of the border

Avantel's network extends 3,400 miles and links commercial and residential users in more than 30 cities in Mexico

to the network in the U.S.
Users in Mexico now have
access to Avantel's:

- Frame-relay network, linked to MCI's HyperStream service
- X.25
- Dedicated Internet service
- Multifax capabilities

Although MCI is first, it isn't the only company to enter the fray. Alestra, a competing partnership, comprises GTE International Telecommunications, Inc., AT&T Corp. and Alfa, one of Mexico's biggest corporations. But Alestra has yet to launch a network

Sprint Corp., a Telmex partner, also plans to offer cross-border

COMPUTERWORLD AUGUST 26, 1996 (www.computerworld.com)

# Navigator + NetWare = roll-your-own intranet

By Peter Young SYDNEY, AUSTRALIA

Enabling Novell, Inc. LAN servers to act as intranet platforms is a painless way to leverage extra business benefits on an existing network, according to officials at Australia's New South Wales State Rail Authority.

But State Rail officials said closer cooperation between Novell and Internet browser company Netscape Communications Corp. would deliver even more benefits.

State Rail gained cost-effective entry to an intranet environment by mounting Novell's Internet software on NetWare 4.1 servers, said John McNamara, intranet manager at Railis, the authority's information systems group. An eight-month pilot project convinced State Rail that replacing its paper-based publications and manuals with the intranet's faster, more efficient electronic distribution processes delivered significant savings, he said.

Key to the decision was the ability to easily layer Internet technology on top of the authority's NetWare 4.1 servers, which kept new hardware investment to zero.

At the same time, State Rail is chafing at what it sees as slow progress by Novell and Netscape toward implementing Netscape's SuiteSpot range of specialized servers, including catalog and mail servers.

"We don't want to buy NT or Unix servers, but Novell needs to understand Suite-Spot is the sort of software we are after, and we would like to see some results" from the extended licensing talks taking place between Novell and Netscape, McNamara said

Important for an organization whose 20,000 staffers are spread across 150 Net-Ware servers, NetWare Web Server integrated well with Novell Directory Services.

Railis is using Novell's LAN WorkGroup Version 5, Web Server, the ManageWise

LAN management product, the GroupWise electronic-mail product and the World Wide Web browser Netscape Navigator.

NetWare Web Server turns NetWare servers into publishing platforms for Hypertext Markup Language (HTML) pages accessed by State Rail staff who log on to the network from 5,000 PCs around New South Wales. McNamara said State Rail was satisfied with NetWare Web Server's ease of use and performance levels.

### Goodbye, paper

Initial business justification for the intranet centered on its role as an in-house distribution engine to replace the slow, expensive process of sending out thousands of copies of paper memos, McNamara said.

Future plans call for paper telephone directories to be replaced with a Web server. The intranet will also be used to carry in-house job listings and contact details on State Rail's 20,000 employees, complete with photos and job titles, he said.

Beyond the LAN, State Rail is working to put a Web interface on its corporate data by giving its Unisys Corp. 2200 mainframe the ability to function as an intranet server.

It is testing the Unisys Amicus operating system module, which recasts queries against the Unisys database into HTMLformatted reports.

The intranet pilot project absorbed about two man-months of effort. Easing the chore of creating Web pages were tools such as Info Access' HTML Transit, which automatically converts Microsoft Corp. Word documents into HTML. Another labor-saving tool for State Rail was Map Edit, which embeds Web links in pages that start life as Microsoft PowerPoint slides before being converted to GIF image files.

Young writes for Computerworld Australia.

### New Products

ACS Software, Inc. has rolled out Auto-EDMS 4.0 for Windows, a document, drawing and image management system designed for workgroups and multisite enterprises.

According to the Lomita, Calif., company, AutoEDMS 4.0 implements document management through user-designated screens that contain textual database information and graphical views of the managed files. It has document management features that include check-in/check-out, revision control, automatic file naming and file activity audit trails. It has built-in viewing and printing support for more than 160 file formats.

Pricing for AutoEDMS 4.0 for Windows starts at \$895.

► ACS Software (310) 325-3055 www.acssoftware.com Sagent Technology, Inc. has introduced Data Mart Solution, an integrated tool set for populating Windows NT-based data marts.

According to the Menlo Park, Calif., company, Data Mart Solution moves critical information closer to end users and lets them share the information and collaborate with others.

It was designed to enhance the performance and maintenance of data marts by featuring centralized control, workgroup functionality and support for business analysis.

Data Mart Solution gives developers a single system for all data mart tasks, such as populating the data mart from various sources, creating metadata and providing end users with tools to access, distribute and collaborate on the data.

Pricing for Data Mart Solution starts at \$50,000.

Sagent Technology (415) 833-6800 www.sagenttech.com

### Briefs

### Fax and figures

Teubner & Associates, Inc. in Stillwater, Okla., added support for Hewlett-Packard Co.'s OpenMail electronic-mail system to its Faxgate faxing software. Faxgate lets users send faxes from their E-mail client. Messages can be sent simultaneously to fax and E-mail destinations.

### **Bay boosts monitors**

Bay Networks, Inc. beefed up its Unixbased network management software with two new tools. Optivity Analysis 7.0 provides Remote Monitoring traffic analysis and is available now. It costs \$5,995. Optivity Planning 7.0, due next month, tracks per formance changes and helps model new network designs. It will cost \$5.995.

### MCI aims at local frame

MCI Communications Corp. launched its first Network-to-Network Interface (NNI) aimed at users who want to save money by accessing frame relay on the local loop. MCI's Hyper-Stream frame network is linked to Bell-South Corp.'s frame-relay network with T1 NNIs. MCI officials said they aim to connect to the rest of the regional Bell operating companies by year's end.

### **NetWare-to-Internet**

Branch offices or small businesses based on Novell, Inc. NetWare will get inexpensive and simple Internet access from Trancell Systems, Inc. The Santa

Clara, Calif., company is offering Web-Ramp IPX Gateway, a plug-in for Net-Ware LANs. It includes a hub, a TCP/ IP-to-IPX gateway, a router and an Integrated Services Digital Network interface for \$1,499. Remote sites and those lacking support technicians can add the gateway without reconfiguring client protocol stacks or a server.

General network appeal

Network General Corp. in Menlo
Park, Calif, announced two alliances to
broaden the scope of its troubleshooting
tools. Collaborating with Telecommunications Techniques Corp. in
Germantown, Md., will improve Network General's ability to analyze protocols for wide-area network connections.
To help diagnose network performance,
Network General will sell and support
Remote Monitoring probes and analysis
software from Frontier Software
Development, Inc. in Chelmsford,
Mass

### **Dual management views**

To help manage SNA and TCP/IP networks from a single console, Neffech, Inc. in Raleigh, N.C., recently upgraded software formerly called EView/Open. EView/SNA Version 2.5 can help operators monitor sessions, customize SNA examination and integrate separate network views on OpenView from Hewlett-Packard Co. The mainframe component costs \$7,500, and the work-station component costs \$2,250.

### MEDICAL ALERT...

### Heartburn Traced to

### Unix "vi" Editor

Don't let a cryptic editor give you indigestion! Trade in the Maalox for Unix tools you learned on the mainframe.

uni-SPF ispf-style Editor, Browse, Utilities, ... even Dialog Mgmt!

uni-XEDIT cms-style Editor with Full Macro Support

uni-REXX Portable System Control and Macro Language



800-228-0255 sales@wrkgrp.com http://www.wrkgrp.com Remember when you got up in the morning and felt like you could conquer the world?



### The feeling's back.

Vanquishing hordes of imaginary foes is no easy task.

Neither is managing a network computing environment with multiple platforms and thousands of desktops and servers around the world.

But the fact is, the tougher the challenge, the more thrilling success can be. Which explains why people relying on Tivoli management solutions are some of the happiest people in the business.

Tivoli's TME 10™ solution makes it possible to bring order and control to virtually any computing environment. It's the only management solution that's truly open, highly scalable and operates transparently across all the major platforms (including the industry's leading versions of UNIX,® Windows,® Windows NT,™ NetWare,® OS/2,® OS/400® and MVS.®)

And now, with the worldwide resources of IBM behind us, we provide unmatched service and support wherever your company does business.

Call us to find out how we can help you manage your network computing environment. After all, you're playing in the real world now.

> 1 800 965-8548 www.tivoli.com



Managing Network Computing. The Smart Way.



and while you'se at it can you make that Internet thing work for us?



Solaris internet Server Software. For secure access, publishing and commerce, Works with what you have.

Keeps you up and running, Grows with you. Contact us at: 1-800-50 NSOFT prompt I or http://www.sun.com/solaris



# The Internet

# Providers struggle as 'net traffic grows

By Bob Wallace

nternet service providers that sell unlimited Internet access to consumers at bargain-basement prices are largely to blame for soaring traffic volumes. This overload is making it tougher for business users to get the reliability and performance they need, analysts said.

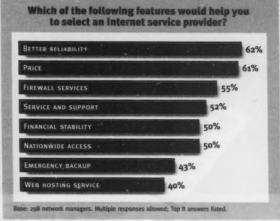
The problem occurs when businesses buy Internet access from providers that also cater to the \$19.95-per-month consumer.

These providers can't afford the network upgrades necessary to give business users higher-bandwidth pipes and

"At \$19.95 a month for unlimited usage, it's not in the [service providers'] best interest to do anything that would boost usage [such as support of voice, video and multimedia] because it's money they have no way of recovering," said Tom Nolle, president of CIMI Corp., a consultancy in Voorhees, N.J.

The options for users are straightforward: Choose a big Internet provider with deep pockets; opt for a smaller and often cash-strapped provider — most of which are likely to vanish, analysts said;

Internet providers, page 65



Source: Business Research Group, Newton, Mass

## Certification classes are popping up for webmasters

By Kim S. Nash

Although they are still sparse and undefined, a handful of formal certificate programs are popping up for would-be webmasters.

Just like Novell, Inc. NetWare engineers or Oracle Corp. database administrators, information systems workers can earn a webmaster license from these fledgling programs.

### Job description

But unlike those more mature licensing programs, webmastery doesn't have accepted minimum technical requirements. Certificates aren't meaningful, some critics say, if there are no widespread definitions for what a webmaster should do.

Some professionals who call themselves webmasters barely know Hypertext Markup Language (HTML); others are Unix wizards who can configure World Wide Web servers in their sleep.

Yet some computer training companies and software vendors have started to offer certificates in various aspects of building and maintaining Web sites.

Although webmastery will never be as quantifiable as, say, learning NetWare 4.1, there are some Web-related skills that can be picked up in classes.

A license or some other acknowledgement of competence will help potential webmasters differentiate themselves in a field where almost anyone who can put together two lines of HTML code can call himself a webmaster, said Manish Patel, a marketing manager at Net Guru Technologies, Inc., a network and Unix training

company in Oakbrook, Ill.

"Čertification is a great idea," said John Robb, an analyst at Forrester Research, Inc. in Cambridge, Mass. "But right now, it's the Wild West."

Formal training programs will catch on, Robb said, partly because of the big investment IS is expected to make in external and internal Web applications.

"If you don't use certified developers, then you could have problems with quality or security," he said. "If you run in to those problems, then it's your own fault."

Net Guru launched an Internet server administration class early this year. Students learn how to set up and troubleshoot servers

offers simple HTML training but

little else related to creating or

maintaining Web applications.

Novell recently announced

a webmaster certification

for domain name and file transfer protocol services as well as basic Internet security, among other topics. Roughly 10 people have taken Net Guru's Internet Webmaster Engineer course, but not all have earned a certificate. The course costs \$2.125.

"We've failed people," Patel said. "If they don't walk out with a core level of understanding, we're not confident they can do the job. We don't want that."

Art is as large a part of being a webmaster as book-learned knowledge, according to those who do it for a living. Therefore, mastery can't be gleaned easily in a classroom.

"I have a dim view of the whole certification idea no matter what it's in," said Tim Evans, an independent Web consultant in Wilmington, Del., and author of Building an Intranet (MacMillan Computer Publishing, 1996).

Certification programs "measure not necessarily your skills but your ability to memorize facts and take tests," Evans said.

A better way to screen wouldbe webmasters, he said, is to develop a hypothetical problem for them to solve. The logic and experience job candidates show by working through a tough situation "tells me much more than any certificate," Evans explained.

### Webmastery 101

Programs for building better webmasters aren't offered by every computer training outfit, but several courses have popped up recently, interested IS workers should quiz instructors carefully before registering. There are no accepted minimum requirements for webmaster training, so each class offers something different.

Net Guru Technologies, at www.ngt.com, specializes in Unix and networking classes but expanded to Internet training early this year. Net Guru's Webmaster Specialist class demonstrates how to write simple hypertext Markup Language (HTML) pages. The five-day Internet Webmaster Engineering



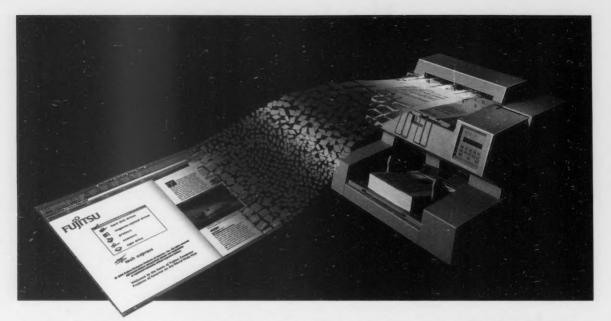
course is more technical; it focuses on setup and management, Web servers and file transfer protocol servers. The Oakbrook, Ill.-based company recently finished a stint at Microsoft, teaching Microsoft's sales engineers about the Internet's infrastructure.

New Horizons Education, at www.newhorizons.com.

class, similar to its Certified NetWare Engineer program. But the three Web-specific courses Novell plans – Web Authoring, Advanced Web Authoring and Web Server Management – won't start until next month. Only East Coast locations will offer them initially. See eduction.novell.com for details. In the meantime, NetWare 4.2 and TCP/IP Administration classes are prerequisites for Novell's webmaster certificate.

- Kim S. Nash

(www.computerworld.com) AUGUST 26, 1996 COMPUTERWORLD



### YOU'RE LOOKING AT HISTORY IN THE MAKING.

Capturing an entire government agency's history was
no small task. Putting it on the Web was yet another.

But Fujitsu scanners, together with Adobe Acrobat®
software accomplished just that, in record time.

Creating a virtual agency for generations to come.

Utilizing Adobe's Portable Document Format (PDF),
Fujitsu scanners enable you to do the same. Now
you can easily transform your most valuable, paperbased information into flexible, fully-searchable

or

Fujitsu's powerful Enhancement Technolog options dramatically improve image quality and provide specialized features for industry-specific amplications electronic documents that can be stored on Internet
or Intranet servers. So they can reside on the World
Wide Web. Or the corporate net. And be viewed
or printed from any computer. Anytime. Anywhere.
Making them available to everyone. Everywhere.
Enabling you to create living legacies of your own.
For the complete story on how Fujitsu scanners
can help you make your own place in history,
your next stop should be www.fcpa.com/new.pdf
Or call 800-414-4349.



# COMPUTERWORLD

Everything you need to know.

Save over 73%

		4100					
ч	Yes. I want to red	ceive my own copy of	COMPUTERWORLD	each week	accept your	offer of \$39.5	95*
	ner year - a savi	nge of over 73% off th	e single conv price	2	. accep. /co.		-

First Name	Mt		Last Name	•			_
Title		Compar	y				-
Address Address Shown: ☐ Home ☐ Business ☐	New O Become	City Single copy price: \$3.00/issue	State *U.S. Only, Canada \$95, Mexi	ino Cantral/South &c		all other co	- untries \$205
Maries drown. Drone Doubles D	THOM D FIGURE .		ete the questions		rience eroo, curope ecos,	an owner co	oriunos seco.
BUSINESSIMPOUSTRY (Circle one) 10. Manufacture (other hara computer) 10. Manufacture (other hara computer) 10. Manufacture (other hara computer) 10. Marchall Amelication 10. Marchallar of Control 10. Computer Percipheral Dealer/Dist./ Pletable 10. Circle 10. Circl	ISAMISACI 19. Chief Prasia Mann 21. Dir.A Com Plan 22. Dir.A Com Plan 23. Dir.A Syst 31. Prog Dew 41. Engl Tech 60. Sys. CORPO	UNCTION (Circle one)  P MANAGEMENT  I reformation Offices/Nos  grant  I reformation Offices/Nos  grant  I reformation Offices/Nos  grant  May, MS Sandose, information  ter  May, MS Sandose, information  ter  and the state of the state of the state  and the state of the state  and the state	(a) Solaris (b) Netware (c) OS/2 (d) Unix Ago, Development Pr	er, Financial Officer NNAGEMENT inagement coourting Ngt. NAL MANAGEMENT rar Libraries, alists, Students onnel (e) Mac OS (f) Windows NT (g) W	H. 20-49 J. 10-19 K. 1-9	entire organi ranches, divis Select only or 1. At this location	zation, ions ne 2. Entire Organizat

COMPUTERWORLD Everything you need to know.

Save over 73%

Yes, I want to receive my own copy of **COMPUTERWORLD** each week. I accept your offer of \$39.95\* per year - a savings of over 73% off the single copy price.

First Name	MI		Last Name	
Title		Compa	ny	
Address Shown:  Home  Business	□ New □ Renew	City Single copy price: \$3.00/issue	State "U.S. Only. Canada \$95, Mexico, Central/S	Zip outh America \$150, Europe \$295, all other countries \$25
		Please compl	ete the questions below.	

		1. At this 2. location	Entire Organizat
D. E. F. G. H.	20,000 ÷ 10,000 −19,999 5,000 − 9,999 1,000 − 4,999 500 − 999 100 − 499 50 − 99 20 − 49 10 − 19 1 − 9	0000000000	0000000000
			1400 0

### **BUSINESS REPLY MAIL**

FIRST CLASS MAIL PERMIT NO. 55B MARION, OH 43306

POSTAGE WILL BE PAID BY ADDRESSEE

### COMPUTERWORLD

P O BOX 2044 MARION OHIO 43306-4144 NO POSTAGE NECESSARY IF MAILED IN THE UNITED STATES



### **BUSINESS REPLY MAIL**

FIRST CLASS MAIL PERMIT NO. 55B MARION, OH 43306

POSTAGE WILL BE PAID BY ADDRESSEE

### COMPUTERWORLD

P O BOX 2044 MARION OHIO 43306-4144 NO POSTAGE NECESSARY IF MAILED IN THE UNITED STATES



# Load-balancing the Web

### Router software boosts response, uptime for Web servers

By Patrick Dryden

Managers of multiserver Web sites will be able to boost performance and reliability with a "smart" routing system that should ship next month.

Start-up HydraWeb Technologies, Inc. is test-

ing its HydraWeb routing software, redirects which

World Wide Web traffic among clustered servers.

**Maintaining balance** 

HydraWeb determines which server can best handle the requests that bombard busy sites. And it lets managers fix and add servers without disrupting site operations.

"If HydraWeb works as promised, we could have one line into one firewall and maximize all our available hardware behind it."

said Ken Alexander, vice president of the Internet Banking Systems group at Long Island Savings Rank in Melville N V

Alexander said he is eager to beta-test HydraWeb with the bank's four Web servers.

The servers provide informa-

tion on mortgage rates and services and also support a multiple-listings

service, which has supplied more than a million house photos since its launch in June.

'We've already had one processor fail on a server, but with HydraWeb, we could have kept running," Alexander said. He said he isn't aware of other products that provide that kind of load halancing and scheduled mainte-

A beta tester at a global communications service provider, who asked to remain anonymous.

praised HydraWeb's concept. This system handles all the packet routing for you at a low level, so we don't have to deal with it through scripts," the beta tester said. HydraWeb so far has improved Web response times, according to this tester, "but we haven't really cranked it up vet to make sure we can cover the peak times

His development group needs faster response times for speedy new Web applications such as games. "With this system, we can route players over to another machine to keep them from ever slowing down," he said.

**Choosing targets** 

HydraWeb provides more efficient handling of Web requests than current domain servers, according to Raj Sharma, president of HydraWeb Technologies in New York. As an intelligent routHydraWeb Technologies, Maw York

Load-balancing software for multiserver Web sites

Availability: Sept. 4

Price: \$4,500 (two servers) to \$30,000 (15 servers)

Function: Routes Web traffic to the best available server for optimal response and fault tolerance. Managers can add or remove servers without changing the TCP/IP address

er. HydraWeb tracks the performance of each Web server so it knows the best target before forwarding incoming requests.

Domain servers just direct traffic to the next available server in the queue Sharma said.

Even if patched to enable some load-balancing, domain servers assume all servers have the same capabilities, he said.

"Many of our high-traffic customers need a better way to balance the load among different types of servers," said Brad Husick, marketing vice president at NetGravity, Inc. in San Mateo, Calif., a developer of advertising management software for Web sites. "Their servers get treated the same right now, but Hydra-Web is a smart solution that can route traffic to the best machine." Husick said

Because Web sites are growing in business importance, managers are seeking tools to improve service and maintain a constant

HydraWeb won't be unique for long, said Clare Price, management analyst at Gartner Group, Inc. in Stamford, Conn.

HydraWeb should ship Sept. 4. Price ranges from \$4,500 for two servers to \$30,000 for 15 servers.

### Web security is key to HP's 'net strategy

**Routing software** 

By Jaikumar Vijayan

Hewlett-Packard Co. is focusing heavily on security issues to make it a key differentiator in the crowded Internet market.

For example, at the recently concluded HP World show in Anaheim, Calif., the company spelled out a series of long-term initiatives it is taking to make the World Wide Web a safer place in which to conduct business

Prime among them is the development of several technologies, including a reliable and secure operating system, technology for individual authentication over the Internet, secure and centralized access control and cryptographic technologies.

### Finding its focus

HP's focus on such Web-related security issues and technologies addresses a vital user concern and could prompt other vendors to focus on similar issues, analysts said.

"A lot of the vendors out there are trying to be all things to everyone," said Carl Lehmann, a program director at Meta Group, Inc., a market research firm in Stamford, Conn.

"HP has a good focus in a market that is very concerned about

security" of its Web-based applications, he said.

"For HP to come along and be one more company that says, 'We are here, we recognize the Internet, and we are here to provide Internet servers,' doesn't make sense," said Lewis Platt, CEO at

Instead, the company will focus on delivering a range of products and technologies that will let corporations securely migrate business-critical applications to the

'Security is one of the most important features. ... I would rank that as a pretty much high priority" for Web-based commerce, said Michael Kapsak, systems manager at B. F. Goodrich Co.'s Aircraft Integrated Systems division in Vergennes, Vt.

HP's road map ties together a series of key alliances and Internet-related announcements that the Palo Alto, Calif., company has made in the past several months.

They include the following: • The acquisition in February of SecureWare, Inc., a Web security and operating system vendor. The two companies are developing software that will let organizations send sensitive data over the Web and provide access control and networking security.

Bundle HP products and service programs with Web server software and Internet management features.

Form strategic alliances and partnerships with vendors such as SecureWare, Netscape and Raptor

Leverage HP's service and support organizations to design, implement and manage products for the

• The release of the Praesidium Authorization Server in April The first of a projected line of similar hardware products, the server authenticates users and controls their access to information on the network. The product is aimed at intranets, but HP will expand the technology to the Internet by year's end.

• The development of personal "smart cards," which will form the basis of user-level security, access and authentication

Ira Goldstein will be in charge of HP's Internet strategy. Goldstein was recently appointed to the newly created position of chief Internet technology officer.

Goldstein is rejoining HP from the Open Group Research Institute, where he served as executive vice president and chief scien-

### Internet providers struggle

CONTINUED FROM PAGE 63

or become your own Internet pro-

Larger providers that focus on higher-margin business users are more likely to have the financial staying power needed to survive and improve their networks to offer more services and features.

Many providers, such as PSI-Net, Inc. and UUnet Technologies, Inc., have already left the consumer market. Others, such as BBN Planet, never sold to consumers to begin with.

ANS an America Online company, and Netcom On-Line Communications Services. Inc. sell to a mix of customers.

Some Internet providers differentiate their services based on measured usage vs. flat rates, geography and time of day. But none has the network infrastructure needed to offer users guaranteed quality-of-service options. And that is keeping some users away.

One such user is the U.S. Chamber of Commerce in Washington. The organization would like to put its national magazine. Nation's Business, online and pipe its video-based education seminars over the Internet.

"We'd be willing to pay more for more reliable basic service and guaranteed availability of highbandwidth pipes for video," said Peggy Morgan, manager of MIS and finances at the chamber of commerce. But Internet providers' "best effort" isn't good enough today, she said.

Jordan Becker, vice president of network service at ANS in Elmsford, N.Y., said quality of service is something his company will probably offer in the future. but he wouldn't elaborate.

Despite the tremendous hype associated with Internet phones and running multimedia over the Internet, analysts said few if any providers have the technology to support high-bandwidth and timesensitive traffic, let alone guarantee quality of service.

### Sink or swim

Analysts agree it is sink or swim time for Internet providers. Most predict massive consolidation.

"Service will continue to degrade if more money isn't spent to upgrade [service provider] networks," Nolle said. "Rather than continue to sink, [the providers] will first stop selling Internet access to consumers."

Many users are dissatisfied with the service they receive and have become their own Internet

A dearth of high-speed Internet access lines, for example, forced the University of Southern California in Los Angeles to join with area businesses to buy their own 45M bit/sec. lines to the Internet.

Morgan is considering doing the same thing with a T1 line.

# HOW WILL THE LAUNCH OF MID-RANGE COMPUTING? LET'S JUST

more than just shoe leather.

all your network servers, it saves you a lot

Maintaining your network is easier now, too. Thanks to some cool new features on

The Compaq ProLiant 5000 has arrived.

And it's going to change everything that lies in its path. Including how you think about mid-range computing.

The ProLiant 5000, with its Pentium® Pro processor, delivers unprecedented performance for mid-range solutions.

But that's just the first half of the story.

In today's client/server environment, you need Pentium® Pro

Compaq Insight Manager, you can get

updates and new software revisions via the

Internet, your modem or CD. And then

System	tpmC	S per tpmC
ProLiant 5000 6/166 M2	5676.93	\$135
HP 9000 Server T500	5621.00	\$3801
WorldMark 5100S	5607.00	\$394
SPARC center 2000E	5124.21	\$323
HP 9000 Model K420	4939.11	\$232
IBM RS/6000 [30	3631	\$289

A lot of companies claim to offer the lowest cost of ownership. But we have the benchmarks to prove it:

transfer them to the Integration Server just one time. You can even

maintain your network

more than power—you need control. So we've combined the Pentium Pro processor with a concept we're calling Integration Management. Giving you new tools to manage your system throughout its entire life cycle.

Improvements to SmartStart now let you set up an Integration Server, which basically serves as a holding tank for all your software. It also simplifies the setup and maintenance of your network. All you have to do is configure your Integration Server and then, using SmartStart, deploy it across your entire network. It not only ensures consistency across

when you're away from the office. All you need is your notebook and a phone line.

We've also partnered with the industry-leading companies of system management applications. So now you can view your entire network in one place. Together, these and other improvements have helped reshape the land-scape of mid-range computing, by creating the most manageable server in the industry. To find out more about the ProLiant 5000, visit our Web site at www.compaq.com, or call us at 1-800-315-7772. It's not just a server. It's a force to be reckoned with.



© 1996 Compaq Computer Corporation. All rights reserved. Compaq registered U.S. Patent and Trademark Office, ProLlam, SmartStart, and Insight Manager are registered trademarks of Compaq Computer Corporation. The Intel Inside Logo and Pentium are registered trademarks of the Pentium Provessor Logo as the Pentium Provessor Logo are trademarks of Intel Corporation. All other brands and product names are trademarks or registered trademarks of their respective companies. "Published TPC-C results as of 6/96, The TPC-C test is a transaction-oriented OLTP environment. Tessults withdrawn as of 4/17/96, in Canada, we can be respected at 18/08/57/616.



# THE PROLIANT 5000 AFFECT SAY ITS CODE NAME WAS "HURRICANE."



COMPAQ

Has It Changed Your Life Yet?





### Almost All Computer Companies Sell Storage.

### How Come The Leader In Storage Doesn't Sell Computers?

The most competitive companies in the world have two things in common. They're organizing their entire business around their information, doing anything and everything they can to leverage it into smarter, more powerful decisions and strategies.

And they're recognizing information storage as business-critical and then treating it as a separate purchase. In other words, buying it from EMC, the world leader in high-performance storage solutions. Unlike typical computer company storage, EMC intelligent storage lets you do a lot more than just store. It consolidates all your information and keeps it online close, immediately accessible across the entire enterprise, regardless of how many different computers or servers are involved. Or how many times they change.

If you'd like to find out how EMC can help your company bring products to market sooner, respond to customers and new opportunities faster and give indispensable support to your overall growth and profit strategies, call 1-800-424-EMC2, ext 218. Or visit us at http://www.emc.com.

EMC<sup>2</sup>
THE STORAGE ARCHITECTS

Free To Do More.

# Corporate Strategies

## **Banc One checks out Web**

Check fraud, account errors targeted with verification service

By Mitch Wagner

anc One Corp. last week launched a World Wide Web-based check imaging and verification service for its large customers.

The OneImage service uses innovative security technology to safeguard proprietary corporate information over the Internet. OneImage was designed to help Banc One customers — including insurance firms and other companies that write large volumes of checks — get a handle on check fraud and

checking-account errors.

"All our customers need is a browser and access to the Internet, and they can have the same access to information

that we have internally," said Rex Plouck, OneImage product manager at Banc One

Most of the time, the checks are debited from customers' accounts automatically. But sometimes, customers want to look over unusual checks — those for very large amounts, for example — before allowing them to be deposited.

Until now, Banc One has sent checks to customers by courier or fax. "We'd have to go through all sorts of contortions," said Steve Dieringer, a vice president at Banc One.

Using OneImage, employees of Banc One's customers can now log in to Banc One's Web servers and check out an image of the exceptional checks using any browser. Once the image is on-screen, the employees can make a "pay" or "nopay" decision on the check.

### Security check

Electronic

commerce

Data that moves over the Internet is en-

crypted using Secure Sockets Layer, a security technology that is standard on the Web.

Banc One also uses OM-Axcess, server security soft-

ware from Open Market, Inc. in Cambridge, Mass. The OM-Axcess software confirms that users are who they claim to be and that they are permitted to access the services they are requesting. OM-Axcess then issues a ticket, or encrypted data string, that lets users access the Web services they have requested.

Each customer must have a SecureNet

Key from Digital Pathways, Inc. — which Banc One issues. The key is a gadget the size of a calculator and contains a chip that generates unique, one-time alphanumeric passwords.

When users access Banc One's check-imaging site, Digital Pathways software on the Web server generates an alphanumeric challenge. Users then type that challenge into their key, which generates and displays the correct response. Users must type the correct response into their Web browser before being allowed to use the One-Image application.

Banc One, in Columbus, Ohio, isn't the first bank to put applications on the Internet. About a dozen banks have been aggressive in this regard, including Wells Fargo Bank and Bank of America. However, Banc One is unusual in the security measures it has taken.

Indeed, Banc One could be the first company to use token-based security in



Banc One and its subsidiaries allow their customers to view checks in process using a new application that has a Web front end

an Internet commerce application, said security analyst Winn Schwartau, president of Interpact in Seminole, Fla.

"One of the biggest problems you have in electronic commerce is user authentication and identification," Schwartau said. "By using any kind of authentication device, you're increasing the security for a transaction."

# Ekco gets housewares in order with AS/400 data warehouse



By Michael Goldberg

Thanks to its AS/400-based data warehouse, manufacturer Ekco Group, Inc. knows that turkey baster sales peak at Christmas, not Thanksgiving. This knowledge, in turn, is helping retailers reap double-digit increases in the sales of Ekco's housewares.

But there is some controversy about the ability of the venerable AS/400 to function well as a data warehouse. Some analysts question the fit of the AS/400 architecture to the task.

### It's working

That isn't stopping Ekco, which has also discovered that the popularity of Mexican cuisine — particularly refried beans — has signaled a rebirth in sales of the potato masher

This and other information have been gleaned by analyzing the company's historical sales database and comparing it with consumer spending data from A. C. Nielsen Co.

AS/400, page 73

### Commentary

### Legal eagles look at year 2000

Stephen M. Honig and Theodore Grossman

The year 2000 software problem is finally getting some high-level management attention because of the potential costs of fixing it. Many of management's questions concern legal issues and liability, most of which are outside the expertise of IS professionals.

There are no court cases yet that establish the legal ground rules for assessing customer liability. Although specific legalities will depend on local law, there are some general guidelines.

What law applies to software?



Stephen M. Honig

Although software typically is "licensed," it is covered by Article 2 of the Uniform Commercial Code (UCC), which deals with the rights of buyers and sellers of tangible goods. Your rights revolve around whether your vendor breached a sales agreement with you, the user.



Theodore

Is there a provision of the original sales agreement that the defective software breaches?

The best case for establishing a legal claim is that the defective software violates an express contractual warranty, such as lan-

Year 2000, page 73

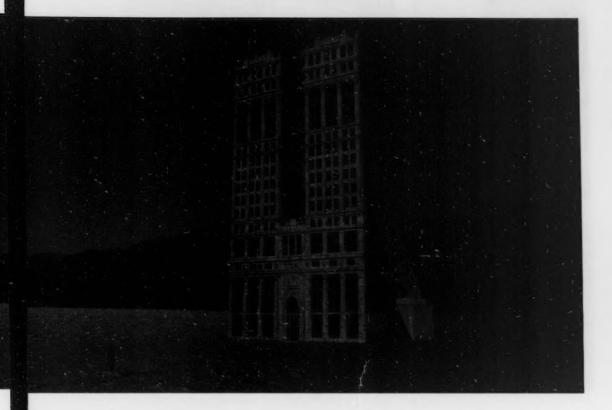
(www.computerworld.com) AUGUST 26, 1996 COMPUTERWORLD



 ${
m IN}$  an industry where companies rise and fall overnight, it's nice to know there's one with something behind it.



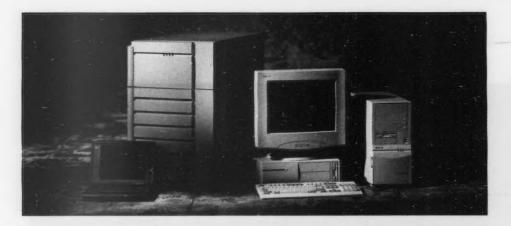








1-800-558-ACER www.acer.com/aac/



### Notebooks

The AcerNote™ Light offers all the features that are needed to take a job on the road—and does so at under six pounds. There's a centrally located touchpad and plenty of room to expand to 40MB of memory, as well as Sound Blaster 16-bit compatible audio capability.

But perhaps what's even more impressive is what the AcerNote Light doesn't offer. Like all that extra weight we've managed to lose. Not to mention all the fat we've trimmed from the price.

- •Intel® Pentium® 100MHz or 120MHz Processors
- •10.4" Active Matrix or Dual Scan Color Display
- •5.8 Pounds
- •Duracell® NiMH Battery
- •1MB Video DRAM
- •2 Type II/1 Type III PCMCIA Slots
- •Pre-Loaded Microsoft® Windows® 95 and Productivity Applications
- •3-Year Limited Warranty/First-Year Express or Replacement Service\*

### Servers

Need a server that's easy to set up and manage? Acer offers not one, but three. The entry-level AcerAltos™900; the AcerAltos 9000, for midsize company or departmental needs; plus the full-featured AcerAltos 19000, a scalable system designed to handle advanced operating systems.

Whichever you choose, you'll get a solid platform for Internet applications, as well as the kind of quality that results when one company designs, develops and manufactures its own systems.

- •CPUs from One 133MHz Intel Pentium Processor to Two Intel Pentium Pro Processors
- •ECC/EDO Memory
- •Up to 8 Expansion Slots (5 PCI, 2 EISA, 1 PCI/EISA), plus 14 3.5" Half-Height Drive Bays
- Acer StartUp Utilities on CD-ROM and Acer Server Manager Software
- Support for Microsoft Windows NT™ Server, Novell® NetWare™ SMP® and SCO® OpenServer™
- •3-Year Limited Warranty/On-Site Service

### Desktops

There's no other poweruser system easier to tailor to a user's needs, or a tight budget, than the AcerPower™ 5000 Series and 9000 Series PCs.

Available in either desktop or minitower models, each of these configurations is designed to run the most powerful business, graphics and multimedia applications. And thanks to its extensive expansion capabilities, the AcerPower can be tailored to something you might consider even more important: the future.

- Intel Pentium 100MHz, 133MHz or 166MHz Processors
- •8/16/32MB EDO Memory up to 128/192MB, 256KB External, Write-Back Pipeline Burst Cache
- •64-Bit PCI Local Bus Video
- •Stereo Plug-n-Play Sound Blaster® Sound Card and 15W Speakers\*\*
- Pre-Loaded Microsoft Windows
   95, Windows NT or Windows for Workgroups
- Software MPEG Support\*\*
- •3-Year Limited Warranty/First-Year On-Site Service







1-800-558-ACER



### Legal eagles look at year 2000 issue

CONTINUED FROM PAGE 69

guage that describes the software as performing all the customer's needs beyond the year 2000.

The software contract also may contain an implied warranty that the software has been sold by an expert vendor upon whom an inexperienced customer relies.

### If a warranty has been violated, why can't I just require the vendor to fix the problem?

The UCC limits the statute of limitations for asserting a claim to four years from delivery, even if the defect manifests itself years later.

The only exception is for warranties that speak to future performance.

### What other legal options do I have?

If your software was acquired more than four years ago, any relicensing within the past four years — particularly upon payment of an additional fee — may restart the clock.

Also, if the software is subject to a maintenance agreement, the broad language of that agreement may be construed to

require fixing the code.

Further, if you engaged consultants to help design your software, the consultants may have an obligation to fix the year 2000 problems.

Finally, many states have adopted laws rendering illegal any activity that is an unfair commercial practice. Perhaps the repeated sale of faulty software would constitute such a practice.

### What about the vendor's rights if I hire someone else to reprogram?

An original vendor may claim that management has disclosed trade secrets by delivering its intellectual property to other programmers, accounting firms or consultants in violation of copyright laws or express nondisclosure agreements.

### What is management's best tactic?

Options here include using the threat of a lawsuit against your vendors to get them to fix the software or to drive down the price of fixing the software, trying to get vendor cooperation, replacing the software entirely or having it reworked by independent vendors.

### It is important that IS and legal forces be directed at an early stage.

Only forceful management action can make sense out of what is a complex and generally underappreciated crisis that is made more difficult by its interdisciplinary nature.

Honig is an attorney at Goldstein & Manello, a law firm in Boston. He specializes in high tech. He can be reached at shonig@gmlaw.com. Grossman is a senior member of the faculty at Babson College in Wellesley, Mass. He teaches information technology and accounting and can be reached at grossman@babson.edu.

### Steps you should take now

What are the first steps you should take to address year 2000 legal issues?

- Gather the legal facts.
  Better communication
  between your company's IS department and
  legal functions is essential.
- Review maintenance agreements to determine whether those agreements require the maintainer to reprogram
- Determine the date your software was licensed or relicensed.
- Be wary of waiving rights against consultants and vendors you hire to help solve the oroblem
- dustry groups and trade associations to compel financial accommodations by the vendors.
- Also consider the potential negative effect of enforcing legal liability. If the software is uniquely within the capabilities and copyrights of a particular vendor, you would be ill-advised to assert liability against such a vendor, thereby bankrupting the only viable reprogramming possibility.

### AS/400

CONTINUED FROM PAGE 69

As typical users of IBM's AS/400 computer, Ekco's managers aren't interested in the "bleeding edge" or in hiring legions of programmers. They are hungry for new ways to extract meaningful information from data they have been collecting for years.

"We're trying to get as much detailed information about what's

happening as close to the consumer end of things as we can," said Charles Dietz, director of information systems at Ekco's data center in suburban Chicago.

The company has built the start of a data warehouse with 1G byte of sales, manufacturing and

financial information. Ekco uses Silvon Software, Inc.'s Sales-Tracker query and reporting tool for analysis.

### Change for the better

Recent changes in the AS/400 hardware and operating system make the platform more suited to data warehousing applications, users and analysts said.

For example, IBM has introduced better-performing hardware that uses 64-bit chips. And the AS/400 now has a gateway for Microsoft Corp.'s Open Database Connectivity programming interface that lets Windows PCs access a server database.

But there is still some skepticism about whether the AS/400 can handle complex tasks that involve terabyte-size databases.

Kevin Strange, a research director at Gartner Group, Inc. in San Jose, Calif., said the built-in

database of the AS/400 needs more tools to support "industrialstrength" analysis applications.

"If an organization is committed to the AS/400, there are certainly now more options to use it as a strategic decision support system. But the complexity of a [large] data warehouse is beyond the AS/400," Strange said.

### Port deal

Slippage

Ekco Group posted

\$8 million in profits on

\$278 million in sales

last year, compared

with \$11.4 million in

earnings on \$267 mil-

lion in sales the

previous year.

A deal announced last month by ShowCase Corp. might help. The company is porting the Essbase

analytical database application from Arbor Software Corp. in Sunnyvale, Calif., to the AS/400. This is the kind of move IBM needs to continue making, observers said.

It boils down to "providing tools that are widely available on other platforms" such as Unix and

Windows NT, said analyst Aaron Zornes, an executive vice president at Meta Group, Inc., in Burlingame, Calif.

A longtime AS/400 shop, Sports Authority, Inc. in Fort Lauderdale, Fla., is a beta-test site for the Essbase port. The sporting goods retailer is piloting a system that store managers and top executives will use to extract sales trends from a 12G-byte data warehouse.

So far, Sports Authority users are seeing answers to queries in 10 minutes from the AS/400 that took three hours on a PC server, said David Brenner, executive information administrator at the company.

"This is data that before was virtually inaccessible," Brenner said. In the future, "we expect to be able to see whether T-shirt sales in the South are better than in the North," he said.

# For Europe, dollar conversion adds to the confusion

uropean organizations dealing with the year 2000 conversion effort have the added task of retrofitting their financial systems for a pan-European currency.

The move to the European dollar will affect financial markets and settlement systems in January 1999. A single currency will be introduced in 2002.

The changes are expected to cost European banks more than \$200 million each to convert their systems and procedures, said Alec Nacamuli, director of payments at IBM Consulting Group in London.

### SAP is ready

On the other hand, firms that are standardizing on global, packaged software — such as SAP AG's R/3 client/server software — are well-positioned to deal with the arrival of a pan-European currency. This is because SAP and other vendors have already built in the necessary conversions.

That was one of the key reasons Norsk Hydro A/S, a multibillion-dollar Norwegian chemical company, chose to standardize its global operations on R/3.

"The year 2000 issue and Euro currency were both big factors two or three years ago when we were deciding on software," said Andy Hafer, chief information officer at Hydro Agri North America, the company's U.S. subsidiary in Tampa, Fla. "Now, it's a nonissue for us."

- Thomas Hoffman and Julia King

### Briefs

### CSC merger approved

The proposed merger of Computer Sciences Corp. (CSC) and The Continuum Co. was approved recently by shareholders of both corporations.

### Portable teams with Sabre

Portable Software has reached an agreement with Sabre Travel Information Network to integrate its Xpense Management Solution expense report software with Sabre's Business Travel Solutions automated travel planning tools. The combined system is expected to begin shipping in December.

### Viasoft adds to year 2000 line

Viasoft, Inc. has expanded its year 2000 products to support other languages and platforms. In addition to its current support of Cobol, Assembler, Natural and PL/1 languages, Viasoft plans to extend support to Cobol for IBM DOS/VSE and AS/400, Fortran for IBM VMS and other languages.

# elluna

Stop shouting! Gentle persuasion is the best way to get users to help keep data under lock and key.

By Steve Alexander

It's the kind of message that has to be communicated gently but effectively.

How do you spread the message of data security throughout a company? How do you get people to really practice security, rather than just pay it lip service or ignore

It's possible to get managers and users to take security seriously. The secret, information systems security managers say, is to enlist management's help, work with users instead of playing security cop, and make security easy.

"Management has to provide the resources security needs and also has to practice security itself. You have to have the help from the top, and that's the bottom line," says Bob Cartwright, an IS information protection specialist at Pacific Bell's network integration business.

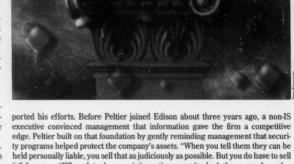
One way to enlist management's support is to explain the liability potential, Cartwright says. Top managers, as officers of a public company, could be sued if it appears they knew about a security risk and did nothing about it, he explains.

### Finding a balance

One company where management got the message is Detroit Edison Co., an electric utility that serves about 2 million customers in southeastern Michigan. Last November, it won an "information protection program of the year" award from the Computer Security Institute, a San Francisco organization of security professionals.

"We work with users to identify the risks and the controls that meet their needs. But the balance to be struck between ease of use and security is up to them," says Tom Peltier, IS supervisor of information protection at Detroit Edison. That stance allows him to avoid being an information security cop. "My job [is] not punitive. My iob is protection," he says

Peltier says the company won the award largely because senior management sup-



it," he says. "When I took over, information security had three people and a \$250,000 budget. Now it has a staff of 10 and a \$1.2 million budget."

Security people need to escape the stereotype of being cops, says Ed Hepker, manager of information security at USA Group, Inc., an Indianapolis student loan



### **Warehousing winners**

Planning to build a data warehouse? If so, The Data Warehousing Institute would like you to look at the feats of nine firms it recently honored in its "best practices" competition.

The projects may serve as models for firms that create data warehouses. They were scored on innovation, portability to other organizations and the creation of "substantial business value." Winners included the following:

• Bristol-Myers Squibb Co. in New York. The pharmaceutical giant transformed legacy internal and external data into an accurate, consolidated view of physicians and managed care organizations.

• Wal-Mart Stores, Inc. in Bentonville, Ark. The nationwide retailer

uses its data warehouse to help determine everything from the right amount of inventory to determining the right prices on the shelves.

· Sears, Roebuck and Co. in Chicago. The retailer improved its planning process with a multidimensional database, which resulted in an anticipated \$138 million in savings.

• The LTV Steel Corp. in Cleveland. Lets users quickly and easily download manufacturing, operations and administrative data critical to their jobs.

• Bayer Corp. in Pittsburgh. The conglomerate's data warehouse enables internal IS to identify requirements efficiently and deliver data to business analysts and management, which has resulted in a 200% productivity increase.

# Security

guarantor and educational consultancy. "Most people have a predefined notion that IS security is there to tell them what they can't do," Hepker says. "We have a lot of work to do to break through that perception." One way to go about it: Stop telling users security horror stories, Hepker says.

"Horror stories just roll off. And the more horror stories you tell, the more people

think of you as selling fire insurance. The insurance mentality has greatly hurt IS security in a lot of organizations, because people don't want to buy fire insurance and are always looking for ways to buy as little as possible," Hepker says,

A better approach is to sell security as a competitive advantage. "If you show how security contributes to the overall goals of the corporation, anybody in the corporation will be willing to invest in it," Hepker says.

Sometimes it's helpful to give users small gifts such as computer disk holders with messages that remind them to practice better security, Cartwright says. He believes gadgets work as security reminders because users love the items and often ask for them.

Sometimes security can be improved if management gives users a list of what is expected of them, says William Hugh Murray, executive consultant for IS security at Deloitte & Touche in Wilton, Conn. "It should be a relatively short list, users should be reminded of it frequently, such as by E-mail, and the list should be made easily accessible by putting it on the server," he says.

Management can enforce security by asking each employee to monitor neighboring workers for compliance, Murray says. "The employee is not being a tattletale; he's just doing his job."

IBM's security program was another model of enforcement, Murray says. Confidential data that wasn't locked up at night was confiscated by security and a receipt was left in its place. The first time this occurred, the user could retrieve the data from security with the receipt; the second time, the user and his or her manager had to retrieve the data together; the third time, the user and manager had to go to a vice president; there was no fourth time.

When it comes to encouraging workers to comply with security rules, Murray

likes to tell the story of the security manager who walked the halls without a security badge until a worker asked him to produce one. The manager did and gave the worker a \$100 bill. After this occurred several times, workers became more eager to check for badges

One thing users should be told: Report anything unusual, "Most attacks on infor-

mation systems today involve some amount of duping or fooling users by asking questions that shouldn't be answered. When a user gets a strange phone call, he should tell management or the security staff about it,"

Jim Milner, a user interface specialist involved in security at Phillips Petroleum Co. in Bartlesville, Okla., says there are ways to improve traditional password security. One simple but effective technique: Mandate that passwords contain at least two numbers.

"It's harder for someone to guess the password, and, because it's not a word, you can't run it through dictionary programs. If a password is in any dictionary, there are lots of programs that will beat it to death until they find out what the password is," Milner

And require that when a password is changed, there can be no more than three letters from the old password, Milner says. He also favors passwords that are acronyms for easy-to-remember phrases.

"Use the first letter out of each of the first five to eight words of a phrase, such as 'Now is the time for all good men to come to the aid of their country.' Now you've got a nonbreakable password, and it's easy to remember the phrase," Milner says.

Peltier, as part of building shared responsibility, takes a tolerant attitude toward users who write down their passwords. Rather than berate them, he just urges them to be careful.

The message in all this advice seems much the same: Information security isn't impossible. It requires a series of small steps rather than a cosmic solution.

Alexander is a freelance writer in Edina, Minn.

consultant for information systems security at Deloitte & Touche in Wilton, Conn., has a simple list of what management should tell workers to encourage better security habits. Much of it is traditional:

Spreading the word

William Hugh Murray, executive

- · Change passwords
- Don't use simple passwords
- · Don't write down passwords
- · Don't share passwords

But he also adds an item he says seldom gets communicated to users:

· Report anything unusual to a manager

### 'net schooling in Canada

Information technology professionals north of the border can update their skills without having to fly to a seminar or trudge off to a classroom.

A public/private partnership in Canada has unveiled custom training over the Internet to address a skills gap among IT professionals.

A student can learn at home or in the office, any time and for any length of time.

The program - Mentys: The Internet Computer Institute - was formed by Global Knowledge Network, inc. in Waltham, Mass., and Canada's Software Human Resource Council (SHRC), a nonprofit organization funded by the federal government and businesses. It is charged

with addressing labor issues in the country's software industry.

Mentys released the field-test version last month; full-service production is expected by Decem-

The program is available only in Canada, but curious foreigners can check it out on the World Wide Web at www.mentys.gknet.ca/.

Students will be able to sign up



The SHRC sees the training as a key to Canada's future economic health.

Officials say a skills shortage is growing as Canadian firms shift from legacy systems to a rapidly growing client/server environment.

- Rick Saia



The good news about our Web-deployable software is that you can set up an office anywhere.



(The bad news is, we mean anywhere.)

Suddenly, no potential

no expansion plan too ambitious.

makes networking new locations and remote or mobile

have instantaneous access to our world-class financials, human resources,

first time, Mac and PC workstations will be speaking the same language and can access the same

supports virtually any client/server platform, and our open licensing policy lets you migrate through future

Visit us at www.lawson.com/insight or call 1-800-477-1357.





© 1996 Lawson Software

business site is too remote,

LAWSON INSIGHT™ Business Management System

employees as simple as adding browser software. End users will

procurement and supply chain process suites without sacrificing functionality. And, for the

databases. All this, at a fraction of the cost of maintaining a wide-area network. What's more, LAWSON INSIGHT

technological changes and upgrades without additional licensing fees. LAWSON INSIGHT. Because the future can't wait.



# October workshops

A list of workshops for IS managers. Some workshops are offered later in the year in other cities. To find the time and location most convenient for you, contact the sponsor.

SOFTWARE LICENSING AGREEMENTS. Cincinnati, Oct. 1; Cleveland, Oct. 2; New York, Oct. 8; Boston, Oct. 9 — Fee: \$495. Contact: Professional Learning Center, Irvine, Calif. (714) 725-0758. Fax: (714) 725-9953. E-mail: 72110.2233@compuserve.com.

EFFECTIVE SKILLS FOR TECHNICAL MANAGERS. TORONTO, Oct. 2-4; Washington, Oct. 8-11 — Fee: \$1,595-\$1,995. Contact: The Learning Tree International, Inc., Reston, Va. (800) 843-8733. World Wide Web address: www.learningtree.com

INTERNET AND SYSTEM SECURITY: ATTACKS AND COUNTERMEASURES. Washington, Oct. 2-4 and Oct. 22-25; New York, Oct. 29-Nov. 1 — Fee: \$1,595-\$1,995. Contact: The Learning Tree International, Inc., Reston, Va. (800) 843-8733. Web address: www.learningtree.com.

PROJECT MANAGEMENT: SKILLS FOR SUCCESS. Washington, Oct. 1-4 and Oct. 22-25; Boston, Oct. 2-9-Nov. 1 - Fee: \$1,595-\$1,995. Contact: The Learning Tree International, Inc., Reston, Va. (800) 843-8733. Web address: www.learningtree.com.

SOFTWARE QUALITY ASSURANCE. Washington, Oct. 2-4; Los Angeles, Oct. 29-Nov. 1 — Fee: \$1,595-\$1,995. Contact: The Learning Tree International, Inc., Reston, Va. (800) 843-8733. Web address: www. learningtree.com

PROGRAMMING FOR INTRANETS AND THE INTERNET. Washington, Oct. 2-3; Boston, Oct. 10-11; San Jose, Calif., Oct. 17-18 — Fee: \$895. Contact: Data-Tech Institute, Clifton, N.J. (201) 478-5400. Fax: (201) 478-4418. Web address: www.datatech.com.

COMMUNICATION AND INTERPERSONAL SKILLS: A SEMINAR FOR TECHNICAL PROFESSIONALS. Washington, Oct. 2-4; Newport Beach, Calif., Oct. 21-23; Chicago, Oct. 30-Nov. 1 — Fee: \$1,195-\$1,375. Contact: American Management Association, New York, N.Y. (800) 262-9699.

SOFTWARE: ISSUES, CONTRACTS, NE-GOTIATIONS. BOSTON, OCT. 7-8 — Fee: \$995. Contact: International Computer Negotiations, Inc., Winter Park, Fla. (407) 740-0700. Fax: (407) 740-0368.

FIREWALLS AND INTERNET SECURITY.
St. Louis, Oct. 7-8; Somerset, N.J., Oct. 10-11; Irvine, Calif., Oct. 21-22; Denver, Oct. 24-25 — Fee: \$995. Contact: Data-Tech Institute, Clifton, N.J. (201) 478-5400. Fax: (201) 478-4418. Web address: www.datatech.com.

SURVIVAL IN TELECOMMUNICATIONS MANAGEMENT. New York, Oct. 7-9 — Fee: \$995. Contact: BCR Enterprises, Inc., Hinsdale, Ill. (800) 227-1234 or (708) 986-1432. Fax: (708) 323-5324.

DATA WAREHOUSE TECHNOLOGY:
ARCHITECTURE, TOOLS AND IMPLEMENTATION STRATEGIES. Chicago, Oct. 810 — Fee: \$1,195. Contact: Digital Consulting, Inc., Andover, Mass. (508)
470-3880. Fax: (508) 470-0526.
E-mail: ConfReg@dciexpo.com. Web address: www.DClexpo.com.

IDENTIFYING AND CONFIRMING USER REQUIREMENTS. Washington, Oct. 8-13; Boston, Oct. 22-25 — Fee: \$1,595-\$1,995. Contact: The Learning Tree International, Inc., Reston, Va. (800) 843-8733. Web address: www. learningtree.com.

SOFTWARE PROJECT PLANNING AND MANAGEMENT. Toronto, Oct. 8-11; Boston, Oct. 15-18; Los Angeles, Oct. 29-Nov. 1 — Fee: \$1,595-\$1,995. Contact: The Learning Tree International, Inc., Reston, Va. (800) 843-8733. Web address: www.learningtree.com.

LEASING NEGOTIATIONS WORKSHOP. Boston, Oct. 9-11 — Fee: \$1,395. Contact: International Computer Negotiations, Inc., Winter Park, Fla. (407) 740-0700. Fax: (407) 740-0368.

STRATEGIC IS PLANNING: FOR SENIOR MANAGERS. Scottsdale, Ariz., Oct. 9-11 — Fee: \$1,350-\$1,550. Contact: American Management Association, New York, N.Y. (800) 262-9699.

MEASURING AND BENCHMARKING IT

Performance. Chicago, Oct. 14-15 — Fee: \$995. Contact: Digital Consulting, Inc., Andover, Mass. (508) 470-3880. Fax: (508) 470-0526. E-mail: ConfReg@dciexpo.com. Web address: www.DClexpo.com.

Business Process Re-Engineering Seminar. Greenwich, Conn., Oct. 15-16 — Fee: \$875. Contact: Pierson Applications Development, Inc., Stamford, Conn. (203) 322-1606. Fax: (203) 329-0173.

PREVENTING APPLICATION MELTDOWN. Chicago, Oct. 16 — Fee: \$495-\$595. Contact: Hurwitz Group, Inc., Newton, Mass. (617) 894-0845. E-mail: info@ hurwitz.com.

INTERNET APPLICATION DEVELOPMENT FOR THE ENTERPRISE. Washington, Oct. 16-18 — Fee: \$1,195. Contact: Digital Consulting, Inc., Andover, Mass. (508) 470-3880. Fax: (508) 470-0526. E-mail: ConfReg@dciexpo.com. Web address: www.DClexpo.com.

INFORMATION SYSTEMS PROJECT
MANAGEMENT. Washington, Oct. 1618; Denver, Oct. 21-23; New York, Oct.
30-Nov. 1 — Fee: \$1,295-\$1,490. Contact: American Management Association, New York, N.Y. (800) 262-9699.

IMPROVING YOUR INTERNAL CONSULTING SKILLS: FOR IS PROFES-SIONALS. Atlanta, Oct. 16-18 — Fee: \$1,295-\$1,490. Contact: American Management Association, New York, N.Y. (800) 262-9699.

HOW TO MANAGE, MOTIVATE AND COACH SUPPORT PROFESSIONALS. Atlanta, Oct. 2:-22 — Fee: \$95: \$695. Contact: Help Desk Institute, Colorado Springs, Colo. (800) 248-5667. Fax: (719) 528-4250. Web address: www.HelpDeskInst.com.

Managing Technical Profession-ALS. Chicago, Oct. 16-18; New York, Oct. 21-23 — \$1,245-\$1,430. Contact: American Management Association, New York, N.Y. (800) 262-9699.

MESSAGING, GROUPWARE AND INTRA-NETS. Orlando, Fla., Oct. 21-23 — Fee: \$1,195. Contact: Digital Consulting, Inc., Andover, Mass. (508) 470-3880. Fax: (508) 470-0526. E-mail: ConfReg@dciexpo.com. Web address: www.DClexpo.com.

Business Process Re-Engineering. Washington, Oct. 22-25 — Fee: \$1,595-\$1,995. Contact: The Learning Tree International, Inc., Reston, Va. (800) 843-8733. Web address: www.learningtree.com.

BEST PRACTICES IN IMPLEMENTING LOTUS NOTES. Orlando, Fla., Oct. 24-25 — Fee: \$995. Contact: Digital Consulting, Inc., Andover, Mass. (508) 470-3880. Fax: (508) 470-0526. E-mail: ConfReg@dciexpo.com. Web address: www.DCiexpo.com.

COMMUNICATION AND THE
CORPORATION. Dallas, Oct. 28-29 —
Fee: \$1,150. Contact: The Information
Management Forum, Atlanta, Ga.
(770) 455-0070. Fax: (770) 455-0082.
E-mail: timf@mindspring.com. Web
address: www.infomgmtforum.com.

INTERNET ACCESS, SECURITY AND FIRE-WALLS. San Francisco, Oct. 29-30 — Fee: \$995. Contact: BCR Enterprises, Inc., Hinsdale, Ill. (800) 227-1234 or (708) 986-1432. Fax: (708) 323-5324.



Check our Web site (www.computerworld.com) for information on upcoming workshops and conferences.

Calendar announcements should be submitted at least eight weeks prior to the event and include the title of the event, dates, location, theme or focus, keynote or major speakers, principal topics and a contact person, organization and phone number.

### SEND ANNOUNCEMENTS TO

Rick Sala, Associate Editor/ Managing, Computerworld, 500 Old Connecticut Path, Framingham, Mass. 01701. Fax: (508) 875-8931.



"Most Valuable Product." "Hot Pick."

"Server of the Year" ... these are just a few of the words industry experts use to describe ALR's Revolution server family. So, whether you're setting up a server for five users or five hundred users, ALR has a multiprocessing Revolution server with power and expandability to spare.

Leading the pack is the ALR Revolution Quado.



the first server to command the power of up to four 200-MHz Pentium® Pro chips. With its sleek black chassis and touchscreen control panel, the Revolution Ouad6 makes conventional

severs look like dusty antiques. And wait until you see it in action. In a recent InfoWorld test, the Revolution Quad6 dominated the on-line processing category, blowing away competitive Pentium. Pentium Pro chip, and even RISC-based servers.

And now we've just introduced the ALR Revolution MP Pro, the departmental-sized server with enterprise class power. Sure, the Revolution MP Pro may look more like a conventional server, but with room for two 200/512 Pentium Pro chips and up to 1-GB of RAM, it's in a class by itself.

Of course, if you're really looking for an enterprise-wide solution, then you need to check out ALR's Rack-Mount solutions. The same technology that powers our award-winning Revolution servers is available in a convenient rack drawer configuration.

And no matter which Revolution server you choose, you'll be able to sleep sounder at night

> thanks to ALR InforManager. This integrated hardware management system is so sophisticated, it singles out potential system problems before they lead to costly component damage and excessive server downtime.

It's a level of technology that you won't find in competitive systems. Technology that's backed by ALR's revolutionary 5/36 warranty and three years of on-site service\*.

So don't hesitate. Visit your local reseller and check out the ALR Revolution series. To find out more, call our toll-free number.

1-800-444-4ALR

Advanced Logic Research, Inc.

two 16550-compatible serial ports, one bidire ECP/EPP parallel port, one mouse port, one NOW AVAILABLE ON ALR'S GSA SCHEDULE - CONTRACT NO. GS-35F-3006D

one 3½" 1.44-MB floppy drive Dual 365 Watt Redundant power supply

floor-standing tower chassis (241/2"H x 7%"W x 261/2"D, 70lbs.)

104-key Windows® 95 compa 2-MB PCI SVGA video

ALR'S MULTIPROCESSING PENTIUM PRO BASED SERVERS

b. ALR REVOLUTION MP PRO (PCI/EISA)

sors. MP SPEC v1.4 compliant.

Godel 1 Standard features Include: 32-MB, expandable to 1-GB (ECC-Error Checking &

eight expansion slots (four 32-bit PCI slots, one 32-bit EISA slots, three shared PCVEISA slot) six 3½" (five internal 1" or three internal 1.6") and five 5%" drive bays

Supports up to two 200-MHz Pentium Pro

256-KB or 512-KB L2 cache







2. ALR RACK-MOUNTAINE REVOLUTION QUADS SYSTEM DRAWER (PCI/EISA) (8U)

Model 1 Standard features Include: 64-MB, expandable to 2-GB ECC (Error Checking

256-KB(SD256 models) or 512-KB (SD512 models)

eight expansion slots (two 32-bit PCI slots, one 32-bit EISA slots, five shared PCI/EISA slots) three 3½° and three 5½° drive bays

up to four 166- or 200-MHz Pentium Pro pro

MP SPEC v1.1 and v1.4 compliant.

six quick hot swap bays

CD-ROM drive CD-HOM drive
one 3½" 1.44-MB floppy drive
redundant 575 Watt power supply
2-MB PCI local bus SVGA video









patible serial ports, one bidirect



Revolutionar





c. ALR REVOLUTION QUADS (PCI/EISA)

Supports up to four 166- or 200-NiHz Pentium Pro processors. MP SPEC v1.1 and v1.4 compliant.

Model 1 Standard features include:

64-MB ECC (Error Checking and Correction) RAM

256-RB of 512-RB L2 cache
fifteen expension slots (seven 32-bit PCI slots,
seven 32-bit EISA slots, one shared PCI/EISA slot)
two 3½" and eleven 5¼" drive bays
one 3½" 1.44-RB floppy drive

104-key Windows 95 compatible keyboard two 16550-compatible serial ports, one parallel port, one mouse port, one keyboard port

C-MB PCI SVGA video

ALR InforManager - ALR's integrated server management with touchscreen control panel 575 Watt power supply double-wide floor-standing tower

double-wide floor-standing tower (25%"H x 12%"W x 21"D, 70 lbs.)

expandable to 2-GB
• 256-KB or 512-KB L2 cache







# When does it take three management applications to manage a single switch?

### A: When you're managing Cisco's Catalyst 5000

If the riddle fooled you, wait 'til you try managing the Catalyst 5000.

Not only do you need three applications—CiscoWorks, VLAN Director and Traffic Director—but none of them are integrated with your management platform. Even to perform simple configuration, you have to go through three different databases, each requiring its own polling. Think that's bad? Now imagine the frustration when struggling to

seamless integration across the entire switched enterprise. You can even manage SmartSwitches from the Web!

There's no question about it...the SmartSwitch is the clear choice

SNMP-based system, including Cabletron's own SPECTRUM. Every

add, move or change is accounted for in a single database, resulting in

over the Catalyst 5000.

manage several switches in the network. Yikes!

There's a better answer: Cabletron's SmartSwitches.

Featuring embedded software on each module, SmartSwitches are easily monitored and controlled through point-and-click applications that run off any

Need more proof? Give us a call at (603) 337-0929 for your

free "Cabletron Beats Cisco" Proof Kit or stop by our Networld+Interop display in Atlanta (booths 1012 and 904).





35 Industrial Way Rochester, NH 03867 • Fax: (603) 337-2211 • Internet: http://www.cabletron.com/

The Cabletron logo, SmartSwitch, SPECTRUM and Synthesis are trademarks or registered trademarks of Cabletron Systems, Inc. Cisco and Cisco Systems are registered trademarks, and Catalyst and CiscoWorks are trademarks, of Cisco Systems, Inc.

Buyer's Guide

The costs and challenges of managing PC LANs have users turning to management suites

# THE DESKTOP & DILEMAN



esktop and LAN management can be like a ball and chain for an information systems shop. Often, IS has been stuck with this job after user departments determined they could no longer manage it. Now IS is facing facts: If it has to live with desktop and LAN management, it must find better ways to handle it.

Corporations "want to minimize staffing requirements and gain consistencies for PC LAN administration," says Richard Villars, director of network software research at International Data Corp. in Framingham, Mass. "Companies are saying, 'If we can't manage from a central site, then we should at least have the same approach from department to department."

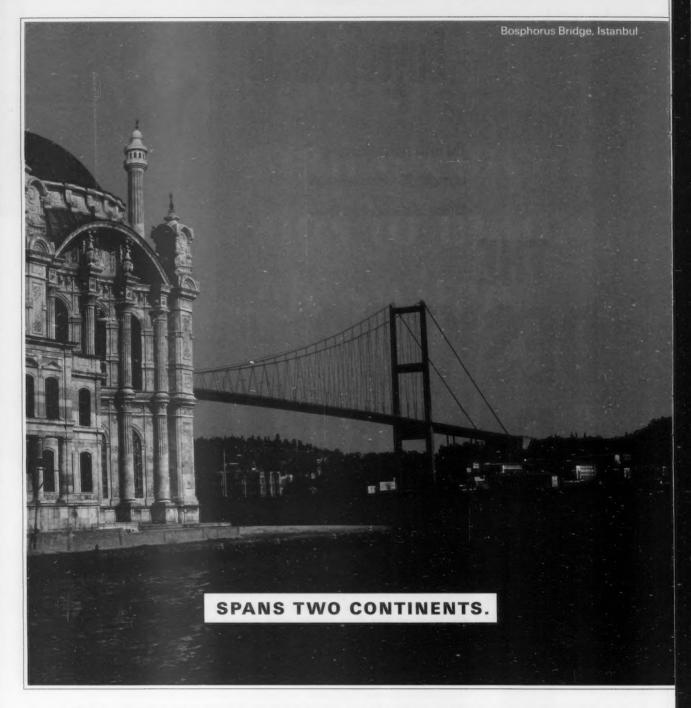
Perhaps the biggest incentive for better desktop management is cost.

Estimates vary, but market research firms, such as Gartner Group, Inc. in Stamford, Conn., and Forrester Research, Inc. in Cambridge, Mass., claim that because of poor management, inconsistencies and redundancies, the average organization has been spending thousands of dollars per year to keep each desktop up and running. For example, Forrester Research estimates that companies spend \$3,830 annually for day-to-day management of each PC.

There have been plenty of product choices for PC and LAN management, from point products that handle a specific monitoring or management task to full-blown enterprise management platforms. But the type that has gained favor among managers recently is desktop management suites.

These tool combinations handle desktop and configuration management, remote monitoring and several other management functions, such as software metering and distribution, from one package.

Desktop dilemma, page 84



Taking the trip from mainframes to open systems? Good timing. Because now there's something that'll take you across the void.

It's called the ClearPath™ family of servers. The only family with the versatility, muscle and technology that can make your move faster, easier and more affordable.

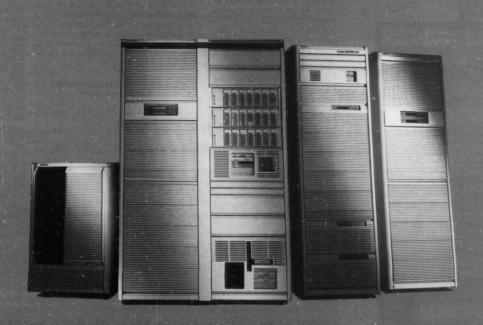
From the largest enterprise systems to the smallest open servers,

there's a ClearPath product to carry your burden. Like the enterpriseclass 2200 Series. The exceedingly scalable SMP Series. And the

HMP, the world's first servers that let you run your existing mainframe

object code-compatible A Series.

Not to mention the series that's bringing the you-can'tget-there-from-here naysayers to their knees: ClearPath



# SPANS TWO UNIVERSES.

stuff, your new open systems stuff or even both from the very same box.

All of which proves that you can finally get to the new world of computing without leaving your investment behind.

**UNISYS** 

# **Snapshots**



# Intel Corp. Network Products Division

Santa Clara, Calif. (www.intel.com)

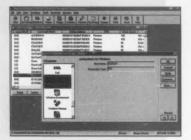
LANdesk Management Suite: 35% market share.

Major components: Remote control, hardware and software inventory, software distribution, server monitoring, software metering, print management, integrated reporting and virus scanning.

First packaged as an integrated suite: January 1995.

Level of integration: Centralized database and alerting system. Users can create scripts to customize interfaces or automatically generate tasks.

**Pricing:** Base pricing, including a five-node license — \$750.



# Symantec Corp.

Cupertino, Calif. (www.symantec.com)

Norton Administrator Suite: 23% market share.

Major components: Hardware and software inventory, software metering, software distribution, desktop virus protection, desktop configuration management and remote control.

First packaged as an integrated suite: April 1996.

Level of integration: Single Windows-based console to access all suite applications, common user interfaces, common application database for components.

**Pricing:** \$635 for a 10-node license pack.

Continued on next page

# **DESKTOP DILEMMA**

CONTINUED FROM PAGE 81

The big advantage of a suite is that a number of management tasks can be performed without having to fumble from one product to another. So IS managers could plan software upgrades by first reviewing inventory data and then launching an electronic distribution of the software. They could then keep tabs on activity through a metering component — and do this all from one management package.

Of course, suites present a big downside: Customers essentially rely on one source to provide them with a range of critical products. But users say they are increasingly willing to make this trade-off to avoid the hassle of integrating tools themselves.

#### The players

The best-known suites are those offered by Intel Corp., Symantec Corp., McAfee Associates, Inc. and Novell, Inc. By last year, Microsoft Corp. had snapped up an 8% chunk of this market with its new Systems Management Server product.

A customer who evaluates management suites is bound to get an earful on integration from the vendors. They're all working to tighten integration of their tool offerings in-

# **EMERGING MARKET**

While an assortment of network and desktop monitoring and management tools have been on the market for years, an emerging market segment of desktop management suites is capturing users' attention. International Data Corp., which defines this market as desktop administration and includes vendors that sell suites or tool bundles, estimated that this segment will generate \$418 million worldwide this year and \$800 million in 1999.

## 1995 DESKTOP ADMINISTRATION MARKET SHARES

Intel	35%
Symantec	23%
McAfee Associates	18%
Novell	11%
Microsoft	8%

ternally and of their suites with other products. McAfee is a good example. Its suite is built from components that the company picked up through several acquisitions, so the company is working to migrate all the tools to one database. It also provides a link to Hewlett-Packard Co.'s OpenView

to allow customers to view inventory data collected by the Mc-Afee tool from within the OpenView environment.

Selecting the suite that best fits your organization's needs won't be easy. The suites have many of the same basic tools — a desktop management function and key management tools such as metering and distribution — so there's no obvious winner from strictly a core function perspective, according to industry analysts and IS managers.

The suite vendors now support Novell's NetWare and Microsoft's Windows NT. The pricing is similar as well, with each lead-

ing package offering a starting price of less than \$800 and support for between five and 10 users.

But a closer look shows that each vendor puts its own spin on its management suite. That could help narrow the choices. Intel, with the biggest chunk of the market, has

# **HOW DOES A MANAGEMENT SUITE IMPROVE OPERATIONS?**

"We have a lot of remote users, and if they are having a problem, we don't have to send someone there. With [Novell's ManageWise], you can take a look at what the workstation is going through from here. It facilitates training because you can troubleshoot with them. You can walk them through it."

— Simon Taufique, network administrator, controller's division, New York University, New York, and a Novell user

"It's difficult to put a finger on hard dollars, but we have been able to accomplish more things and take on more projects."

— Jose Aguilar, senior systems engineer, Mapco, Inc., an energy company in Tulsa, Okla. Aguilar installed Intel's LANdesk last year.

"It's knowing what's going on the network. In a campus like ours, it isn't hierarchical. It's a changing environment. We need to know what's up, what's down, what's going on."

— John-Eric Langdale, systems analyst, University of California School of Medicine, San Francisco, which runs Novell's ManageWise

"Software metering allows us to save a lot of money. In the past, we would buy a whole suite of software for someone. Now we can control the number of copies we have on the net and run them legally. It gives us a smart way of determining when we need to buy more copies."

Diane del Vecchio, senior network administrator,
 Smith Environmental Technologies Corp.,
 Plymouth Meeting, Pa.,
 which runs McAfee's Saber LAN workstation package

worked with a broad range of partners, including HP and IBM's Tivoli division, to link to their bigger enterprise management products. In addition, Microsoft and Novell use some of Intel's LAN management technologies in their products.

Novell has a clear edge as a networking leader in the group. Its packaging also differs because it offers metering and distribution capabilities as add-ons, whereas other providers bundle those tools in their core suites.

One potential advantage for Symantee is its plan to offer a modified version of its suite that would essentially let buyers pick and choose the components they want.

McAfee has its own twists. For instance, it recently announced plans to link its suite with a help desk package from Vycor Corp., which it acquired earlier this year.

#### Users' different needs

Ultimately, industry observers and IS managers say companies should pick a suite that works best with the way their organization wants to handle desktop management. "Different environments will be successful with different products," says Ray Paquet, a senior research analyst at Gartner Group. "Ask yourself, What is my environment and what will the needs be?"

Overall, IS and LAN managers say management suite packages have provided big benefits by helping them gain control over what has been a frequently chaotic LAN environment. The accompanying articles provide a look at how the suites are holding up at a number of organizations, based on interviews with users of each of the four top providers of suites.

Cafasso is a freelance writer in Walpole, Mass.

# WHY IS SUITE INTEGRATION IMPORTANT?

"Integration is quite crucial. The interface is the same, and it's nicely tied together. So it reduces the learning curve and keeps it smooth. I think it's a little cheaper than going best of breed."

— Lance Bedingfield, systems engineer, Intermountain Health Care, St. George, Utah

Intermountain Health Care, St. George, Utah Bedingfield overseas a 200-node Novell LAN using Intel's LANdesk suite.

"They've taken the burden of making all the components work together off the shoulders of the administrator." Integration "is the last thing you want to worry about. You just want to get in there and make it work."

— Simon Taufique, network administrator, controller's division, New York University, New York, and a Novell user

# WHAT ADVICE WOULD YOU GIVE IS MANAGERS?

"Do adequate testing before implementation. There were a couple of surprises we didn't catch [because] our pilot was a narrow focus of machines. You need to get a cross section of systems tested before a final selection is made."

Paul Babcock, senior systems analyst,
 Herman Miller, Inc., Zeeland, Mich.,
 and a Symantec customer

"Determine what your needs are, which can be the hardest part of all."

Diane delVecchio, senior network administrator,
 Smith Environmental Technologies Corp.,
 Plymouth Meeting, Pa.

"Everyone has their own likes and dislikes, so go out and identify three or four products and test them. If you've been driving a Chevy and it starts every morning, it's hard to go out and buy a Plymouth."

— David Bixby, vice president of MIS, People's National Bank and Trust, Ottawa, Kan., and an Intel user

# WHAT ARE SUITES MISSING?

"The major shortcoming is it's really not a comprehensive network management tool. They are not complete and can't compete with a NetView or OpenView.... I want to be able to look at my network, to be able to go all the way from the desktop to routers, bridges, traffic [and] any bottlenecks."

— Jose Aguilar, senior systems engineer, Mapco, Inc., Tulsa, Okla., and an Intel user

"Make it faster. Whatever you have today, make it faster, like inventory collection and data replication." On the inventory side, the system scans for hardware and software devices whenever a workstation comes on. The process takes anywhere from 10 seconds to two minutes, and he wants the process to be invisible to users.

Paul Babcock, senior systems analyst,
 Herman Miller, Inc., Zeeland, Mich.,
 and a Symantec customer

"Tighter integration with Novell's [Novell Directory Services]. I would rather have just one product rather than toggling back and forth between NetWare's administration tools and ManageWise."

— Simon Taufique, network administrator, controller's division, New York University, New York, and a Novell user

# **Snapshots**



# McAfee Associates, Inc.

Cupertino, Calif. (www.mcafee.com)

Saber LAN Workstation 6.0: 18% market share. \*

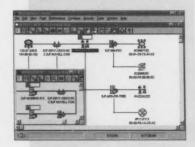
**Major components:** Software metering, desktop management, software and hardware inventory, and software distribution.

First packaged as an integrated suite: June 1996. It is based on two suites: the former Brightworks and Saber Software Corp. tool sets, which McAfee acquired.

Level of Integration: Individual components use separate databases, but the company is working to move the tools to a single, SQL-based system.

Pricing: Approximately \$40 per node.

\* The McAfee market share is a combination of the Brightworks and Saber market shares.



#### Novell, Inc.

Orem, Utah (www.novell.com)

ManageWise: 11% market share.

Major components: Remote control, hardware and software inventory, virus detection, file transfer and configuration change management.

First packaged as an integrated suite: January 1995.

**Level of Integration:** Components share data and access information from a Btrieve database. Tools use a common interface.

Pricing: \$795 for five users.

# This kind of editorial quality...





#### Computerworld

For more than 29 years, Computerworld has been the primary source of information on information technology for the enterprise. That's why thousands of IS professionals read Computerworld every week.

#### Computerworld Global 100

A Supplement profiling outstanding information technology users throughout the world. These organizations – from global corporations to government agencies – are defining how global business will be conducted in the future. Translated into 13 languages, distributed in 23 countries.

#### Computerworld Campus Edition

The Computerworld Campus
Edition is an annual magazine
written specifically for, and distributer
only to, top IT students at U.S college
campuses.

# leads to these kinds of awards.



Computerworld Recipient of 21 awards from three editorial award programs in just the past three months alone. It's a record to be proud of for the newspaper of record in the IT world.

**Computer Press Awards** June 19, 1996

Best Technical Trade Magazine Computerworld 8/28 & 11/6/95

Best News Story Computerworld "Lotus on the Block" 6/12/95

Best Investigative News Story Computerworld "Ticket to Nowhere" 12/11/95

Runner Up Best Technical Feature The Computerworld Guide to High-end Desktop PCs"

Folio's Magazine's Editorial Excellence July 11, 1996

Winner: Computing Trade Publication Category Computerworld 8/28/95

August 2, 1996

Editorial Category:

First Place: News Series Computerworld "Win 95 Off and Running" 2/95 - 8/95

Second Place: News Series Computerworld "Lotus on the Block" 6/12/95

Graphics Category:

First Place: Computergenerated Infographic Computerworld Client/Server Journal's "Document Management" 2/95

American Society of Business First Place: Opening Page Spread Computerworld's In Depth Feature, "Swamp Thing" 8/7/95

Second Place:

Front Cover, Non-photo The Computerworld Global 100 magazine 5/1/95

Second Place: Contents Page Computerworld's Campus Edition magazine. 10/31/95

Honorable Mention: **Opening Page Spread** Feature, "Buried Alive" 12/11/95

**American Society of** Business Press Editors – Northeast Regionals July 23, 1996

First Place: Front Cover Non-Photo The Computerworld Global 100 magazine 5/1/95

First Place: Contents Page Computerworld's Campus Edition magazine 10/31/95 First Place: Opening Page/Spread Computerworld In Depth Feature. "Swamp Thing" 8/7/95

First Place: News Series "Win 95 Off and Running" 2/95 - 8/95

Second Place: News Series "Lotus on the Block" 6/12/95

Second Place: Opening Page Computerworld's Management Feature, "Buried Alive" 12/11/95

Second Place: Regular Department Computerworld's Management Feature, "Buried Alive" 12/11/95

Third Place: Regular Department Computerworld "Training for MIS Failure" 12/11/95

Honorable Mention Computerworld Client/Server Journal "DCE Delivers" 12/11/95

COMPUTERWORLD

Everything you need to know.

# Lesser-known PC LAN tools hold ground in niche areas

# BY AMY MALLOY

C IAN management products are so plentiful the options can boggle your mind. Possibly the easiest way to look at the market is to divide it into two: On one side are the four vendors that own the bulk of the market — Intel Corp., Symantec Corp., McAfee Associates, Inc. and Novell, Inc. On the other side is a handful of other vendors, several of which are extending into the arena from other industry segments.

"No vendor has locked up the entire market," says Rick Villars, an analyst at International Data Corp. in Framingham, Mass. Computerworld has gathered opinions about products other than these from the Big Four.

Analysts and users provided views on the Desktop Management Suite (DMS) from Seagate Software, Inc.'s Network and Systems Management Group in Cupertino, Calif.; ServerWorks Manager from Digital Equipment Corp.; TME 10 NetFinity from Tivoli Systems, Inc. in Austin, Texas; Systems Management Server (SMS) from Microsoft Corp. in Redmond, Wash.; Cenergy from Tally Systems Corp. in Hanover, N.H.; and the Enterprise Desktop Management Suite (EDM) from Novadigm, Inc. in Mahwah, N.J.



Tivoli's NetFinity lets users set up alerts

Analysts say if these vendors want to keep up with the larger players, they must build relationships with hardware vendors. "The goal of all products is to simplify the solution," Villars says.

The companies that bundle with hardware "have a chance of getting a greater market share," says Chet Geschickter, manging director at Hurwitz Group, Inc. in Newton, Mass. That is where much of the battle is being fought, he says.

Users say they want the ease of use that such combinations provide. But simply bundling servers with hardware won't satisfy all users; the products need to be improved, too. For instance, they need tighter integration with enterprise management systems such as IBM's NetView, Hewlett-Packard Co.'s OpenView and Cabletron Systems, Inc.'s Spectrum. "All these products have the same weaknesses. They are integrated more in spirit than technology, but they all have recognized the right ideas," Villars says.

In the future, users should see better links to enterprise management systems, increased ability to do things automatically and increased support for the Windows NT platform, Geschickter says.

Users expect all the products to at least have an inventory system, a tie to a software distribution facility and remote access, Villars says. Beyond

that, each product includes additional distinguishing features.

# Seagate's Desktop Management Suite www.seagate.com

DMS combines WinInstall from OnDemand Software, Inc. in Naples, Fla., WinLand from Frye Computer Systems, Inc. in Boston and Proxy tools from OEM supplier Funk Software, Inc. in Cambridge, Mass. The suite provides inventory, software distribution and remote control capabilities.

Proxy, a remote control program, helped the Welborn Clinic in Evansville, Ind., trim the time information systems staffers spent in the field. Proxy probably pays for itself every week," says Jeff Gorman, systems administrator at the clinic.

And WinInstall, the suite's software distribution application, created excitement among users.

Users expressed basic satisfaction, but they want tighter integration, better documentation and control of a Windows 95 machine via Proxy.

Seagate says a new version will be available at the end of the month. It will have a Seagate antivirus add-on module and support for NT 4.0 and 32bit applications.

# Digital's ServerWorks Manager

www.dec.com

Digital bundles ServerWorks Manager, a package of network management tools, with its Prioris servers. The tools are ServerWorks Manager Simple Network Management Protocol agent, ServerWorks Manager Applications and Manage-Works Workgroup Administrator. This trio lets administrators perform network management and administration, server management and LAN analysis.

Because it already holds an established place in the hardware market, Digital doesn't need to search for a hardware partner, Villars says.

The company claims the product's open architecture makes integration with enterprise management products such as NetView and Open-View relatively seamless.

### Tivoli's TME 10 NetFinity

www.tivoli.com

TME 10 NetFinity is another offspring of a hardware vendor. This makes bundling it with IBM's server a natural response. (Tivoli became a division of IBM when the two companies merged in March.)

With this suite of tools, administrators can remotely access and manage systems, collect software inventory and perform other management tasks.

Several of those features appeal to users. Hardware identification, remote control, remote access support and screen capture won over Vince Pepe, a distributed systems analyst at Washington Mutual Bank in Seattle. Pepe has one request. "I would like to see them include packet capture and

the ability to examine the packet structures. That would complete the package for me," he says.

The ability to set up alerts works well for Pepe and Lloyd Blauen, a senior systems engineer at OR Group, a subsidiary of US Air in Arlington, Va. When Blauen was out of town, he knew someone had rebooted his machine when the alert dialed his beeper.

# Microsoft's Systems Management Server

With SMS, an administrator can automatically inventory software and hardware and distribute and install software as well as remotely access systems to correct problems.

Analysts and users hope SMS will smooth out the rough edges with Version 1.2, which is in beta testing and scheduled for release by fall. "It is still a 1.0-type version," says Angel Cortez, senior systems analyst at Nordstrom, Inc. in Seattle.

That isn't to say Microsoft isn't on the right track. "They have a vision of a decent scalable architecture. It's not there yet, but they have the right idea" says Chris King, an analyst at Meta Group, Inc. in Reston, Va.

And certain strengths are already in place. "SMS solves a lot of our troubleshooting needs," says Andrew Drooker, project manager at Turner Broadcasting Sales, Inc. in Atlanta.

#### **Tally Systems' Cenergy**

www.tallysys.com

Cenergy incorporates WinInstall for software distribution, NetCensus for inventory and Centa-Meter for software license metering and monitoring to achieve what Tally Systems calls a desktop asset management suite.

It's not uncommon for a company to have more than one management package. "Very few users have only one product. They can have three, four, five," Villars says. Tally Systems recognizes this and recommends using Cenergy alone or with Microsoft's SMS. The company claims it works well in the SMS environment.

# **Novadigm's Enterprise Desktop Manager** www.novadigm.com

Novadigm defines EDM as a distributed software environment that ensures each user has the correct version of an application, and it claims to do this automatically.

It updates and discards versions of software without the administrator's intervention. This is possible through recognition of object differences. This capability appeals to Geschickter. "It focuses on the deltas in the environment," he says.

Although EDM doesn't offer the same capabilities as other products in this category, one analyst says Novadigm is doing a lot on the desktop.

Malloy is Computerworld's assistant researcher.

# Extras

# Associations, professional organizations

Desktop Management Task Force 2111 N.E. 25th St., JF-2-51 Hillsboro, Ore. 97124 (503) 264-9300 dmtf-info@dmtf.org www.dmtf.org

# Conferences, seminars

#### International Symposium on Integrated Network Management ISINM '97

May 12-16, 1997
Hotel Del Coronado
San Diego
Contact: Aurel A. Lazar
Department of
Electrical Engineering
Columbia University
New York, N.Y. 10027
aurel@ctr.columbia.
edu

LAN '96 UK Sept. 25-26 Edinburgh International Conference Centre Edinburgh, Scotland 0990-329-327 LAN '96 UK Freepost SCO 210 Glasgow G5 5BR

# references

#### Guide to Managing PC Networks Steve Steinke PTR Prentice Hall, 1995 (800) 947-7700

# A Management Assessment of the

Jeffrey A. Pearson University of Texas, Austin, May 1995 cobweb.bus.utexas. edu/dmi/dmi.html

#### Reducing the Cost of LAN Ownership Salvatore Salamone and Gree Gianforte

Salvatore Salamone and Greg Gianforte Van Nostrand Reinhold, 1996 (800) 842-3636

# **Hewsgroups**

comp.dcom. net-management

# Price check on four.

<b>1</b>	2	3	4
Compaq Prollant 4500	Compaq Prollant 4500	HP NetServer LH2	AS/400 9402 4SE
Pentium 166MHz	Pentium 166MHz	Pentium 133MHz	64-bit PowerPC AS
MS Windows NT	SCO UNIX	SCO UNIX	OS/400
SQL Server	Oracle 7.1	Oracle 7.1	DB2 for OS/400
\$22,009*	\$26,003*	\$29,205*	\$17,720*

If you're in the market for a small business server, you'll want to check out AS/400° Advanced Series. It's a lot less expensive than similarly configured competitive systems. In fact, prices start as low as \$7,995'.

If that's a surprise, consider this. With AS/400, the operating system, relational database, security, systems management and communications are fully integrated into the system. That means there's no need to go out and find the latest and greatest software—it's all built in. No assembly, no compatibility testing, no programming. You can get right down to business. And here's another surprise. According to an independent consultant's study' of American small businesses, AS/400

has the lowest cost-of-use over a five-year period. The study compares leading INTEL-based LAN server platforms to the 64-bit AS/400 and examines system, staffing and networking expenditures.

So if it's time to move up to a server, put AS/400 Advanced Series on your shopping list. Costs less to buy. Costs even less to own. If you'd like to know more, visit us at www.as400.ibm.com or call 1800 IBM-4YOU, Priority Code GAS6B002 for a detailed information package including a copy of the IDC report.

Solutions for a small planet™



# In Depth

Cable modems. Phone companies. Seems as if everyone's jockeying to take remote computing to the next level. With no clear favorite, the whole field is

# Wired to wire

By Steve Alexander

or information systems managers, one thing is certain: Telecommuter data traffic and the firewall problems that work-athome employees pose will increase.

Whether cable modems will target home or business use initially is an open question. Analysts are divided. Peter Krasilovsky, a senior analyst at Arlen Communications, Inc., a market research firm in Bethesda, Md., says cable modems may make more sense for business applications than for residential use because direct fiber connections are more available to business.

But David Pangrac, director of Network Creation Services at Andersen Consulting in Chicago, disagrees. "The primary reason for cable modems is for residential use because it ties you to data networks from your home," he says.

Ed Lewis, marketing manager at Motorola, Inc.'s multimedia group in Arlington Heights, Ill., predicts the business market for cable modems will take off next year. "There is a lot of work be-

ing done behind the scenes. You'll see significant business use in 1997," he says.

Continental Cablevision, Inc. in Boston, the nation's third-largest cable television company, is running commercial trials in Exeter, N.H., where a private network links 30 physicians' offices with the local hospital. Each office is charged \$300 per month. The company is also running extensive tests aimed at the home market.

Dave Fellows, senior vice president of engineering and technology at Continental, says two cable modem factions are competing in his company: one that favors rolling out business services first; the other, residential that improvement will services.

The first group says business can afford a higher cost per month, that winning one corporate customer might result in 100 individual subscriptions and that IS help desks in corporations would solve many technical problems with cable modems without the intervention of the cable company, Fellows says. Residential advocates say that market is larger and avoids the biggest downside of the business market: corporate firewall problems.

# **Firefighting**

Hot tip:

Remote computing

will get better and

faster in the next year.

But alas, there's no

safe bet on just how

happen. Cable modem

vendors are lostling

with telephone

companies, and it may

take a while to

separate the

thoroughbreds from

the also-rans.

The firewall problem is this: Corporate workers at home need to access their

office applications as if they were inside the corporate firewall but without compromising the protection that a firewall provides. "This offers a different challenge in managing security and operating a firewall," Fellows says.

One solution is encryption. Another is what Fellows calls "IP tunneling," in which corporate routers send all traffic from telecommuters' Internet Protocol addresses to one IP address inside the corporate firewall, providing more

scrutiny over who gets inside. How are the business trials going?

Simon Doherty, an IS specialist who manages Windows NT and Unix workstations at Wharton Business School in Philadelphia, is participating in a cable modem trial run by Comcast Cable Communications, Inc. in Philadelphia. Doherty says the cable modem often saves him the 90-minute round-trip to work to deal with emergencies. The downside, he says, is that the upload speed has been slower than an Integrated Services Digital Network (ISDN) line would be - certainly not the 1.5M bit/sec. he was expecting. Downloads also are slower than he expected, about 1M bit/sec. rather than 6M bit/sec.

Doherty plans to try Asymmetric Digital Subscriber Line (ADSL) and other cable modem alternatives because he says he believes phone companies have higher reliability.

# The telcos strike back

Competition for cable modems will come from telephone companies such as Bell Atlantic Co., which is conducting



# Tout sheet

Here's the field in the remote-computing derby. Availability dates are according to Beth Gage, an analyst at consulting firm TeleChoice, Inc. in Tulsa, Okla.

trials with ADSL, a twisted-pair tele-	from loose connectors or improperly	Conven dial-up
phone line technology.  Beth Gage, an analyst at consulting	installed cable equipment in homes.  Hewlett-Packard Co,'s solution to	ISDN
firm TeleChoice, Inc. in Tulsa, Okla.,	the noise problem is a frequency-	6-11-
says ADSL will be rolled out in 1997	hopping technology that seeks the	Cable n

says ADSL v and 1998. "However, if cable TV companies follow through with their 1997 installation projections, that could speed up what the phone companies do," she says.

Kamran Sistanizadeh, director of network systems engineering at Bell Atlantic Network Services in Arlington, Va., says his firm is conducting ADSL technical trials now and will run marketing trials in the fall for residen-

tial and small business service. Bell

Atlantic customers will be able to re-

ceive data at 1.5M bit/sec. and to send data at 64K bit/sec.

Sistanizadeh says ADSL will offer customers a secure dedicated line, which he claims will provide higher quality service than the shared cable TV network a cable modem would use.

Fellows concedes that cable TV companies haven't historically been as dependable as telephone companies - in most cases, he says, because they weren't running fiber networks. But he says cable firms are upgrading their networks to provide fiber to neighborhood nodes and are installing network monitoring centers that watch for bit error rates, dropped packets and end-of-line signal performance. Although 70% or more of cable systems will need upgrades to offer cable modem service, the industry will accomplish that within three years, Fellows claims.

#### Fading in the stretch?

Both cable modems and ADSL have potential technical problems.

Pangrac cites electronic noise that

quietest channel. "The noise factor is not going to slow the rollout," says Casey Sheldon, HP's brand manager for interactive broadband products in Cupertino, Calif.

Krasilovsky says there may be problems scaling up from initial cable modem trials, which often involve about 100 users, to commercial systems that serve thousands. "What all the cable TV engineers say secretly is, 'Wait until you have a thousand users trying to download something: then you'll have big trouble," he says.

Fellows says scaling up will be a challenge, particularly because Continental hopes to have 1 million computers on its cable modem network within four years. But he says it can be done by sticking to existing data network and World Wide Web server standards.

The telephone companies' offerings aren't without drawbacks. Sistanizadeh acknowledges that the XDSL products (see box at right) have distance limitations: Users who are more than 15,000 to 18,000 feet from the phone company's central office won't be able to use those services. But he says the majority of Bell Atlantic's customers are within that distance.

It's unclear whether cable modems or telephone company alternatives will win the greatest market share. "It's too soon to say who is going to win," Sistanizadeh says. "I'm sure there are going to be market segments for cable modems and for ADSL."■

Technology	Speed	Availability
Conventional dial-up modems	28.8K bit/sec.	Now
ISDN	64K to 128K bit/sec.	Now
Cable modems	Officially, up to 10M bit/sec. in both directions, but bottlenecks may reduce that to 1.2M to 5.5M bit/sec. Speeds in some early trials have been even slower.	Trials now; widespread business use expected in 1997 or 1998

	the DSLs, the Digital Subscribe -speed data and voice communi pair lines. Here are the progen	cations over twisted-
ADSL (Asymmetric DSL)	Typically provides 1.5M bit/sec. to the user and 64K bit/sec. from the user. Provides voice and data simultaneously.	Trials now; limited commercial availability expected early next year.
HDSL (High-hit-rate DSL)	Typically provides 768K bit/sec. in both directions. This symmetric service handles either voice or data, but not both at once.	Technology is available to- day but isn't being marketed for Internet access or home offices. Rollout timing for those markets depends on phone companies.
SDSL (Symmetric DSL)	1.5M bit/sec. in both directions. Handles data and voice at the same time.	In trials, but likely to roll out a year later than ADSL.
VDSL (Very high DSL)	Expected to provide 25M to 56M bit/sec. downstream and 1.5M to 3M bit/sec. upstream, but it's still in development. Actual capacity will vary with quality of local phone lines.	Five to 10 years off. Works on copper wire for only 500 feet so must wait for the construction of more hybrid fiber coaxial systems.
RADSL (Rate Adaptive DSL)	This planned service would automatically and dynamically match its transmission speed	Probably not until late next year.

to the modem with which it is

communicating.

Alexander is a freelance writer in Minne-



# **Computer Careers**

# Programming pioneer

HBO's James Altucher is marrying IS skills with interactive television creativity to redefine the programmer.

By Leslie Goff

rogramming is taking on a whole new meaning for some IS professionals working on World Wide Web development projects.

James Altucher, a systems

Inc. in New York, programmed the cable television network's Web site (www.hbo. com) and is the brains and brawn behind one of the site's key features, a program — that's "program" in the TV sense — called III:am.

III:am is reality TV on the Web. Altucher documents the unglamorous side of life on the streets of Manhattan, which around 3 a.m. begin to take on a surreal quality uniquely their own. As the off-camera interviewer of people who roam the night, he approaches total strangers to ask the burning question, "Why are you out at 3 a.m.?" Their responses, which tend to take many dramatic turns, are the heart of the show.

Altucher, who earned a bachelor's degree in computer science from Cornell University in 1989, is among a growing breed of information systems professionals who are bringing their personal interests, technical experience and project management skills to the creation of corporate Web sites.

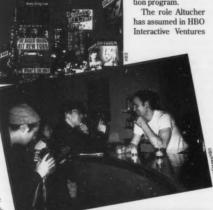
As the producer of III:am, Altucher blends a background in interactive TV with Internet expertise. And he fosters an ongoing interest in the erratic and bizarre to explore how HBO's Web site can reflect the network's corporate — or on-air — identity, while offering its own intrinsic entertainment value.

Although he wears a producer's cap and works mainly for HBO Interactive Ventures — which is responsible for HBO's Web site and intranet — Altucher still reports to HBO's IS chief, Bruce Probst. He still works alongside fellow computer programmers. But he spends his days organizing shoots, editing tapes, transcribing interviews, posting material to the site and working on other HBO Web entertainment ventures, such as Roadkill, an upcoming show that will follow comedian Drew Feldman as he picks up hitchhikers on a cross-country trip.

"The development of a Web site has a strong IS orientation in terms of project management," Altucher says. "Transferring data between secure machines behind firewalls, determining what we can use on the site from the HBO databases — like schedules — and making backups of everything is all very ISoriented."

Altucher already had experience with interactive TV before he joined HBO. He landed at the network in August 1994 partly because of *The Woggles*, a Dr. Seuss-style animated virtual reality environment he

helped create as part of a team in Carnegie Mellon University's Oz Interactive Fiction program.



The setting — the streets of Manhattan at 3 a.m. (top); the players — the crew of Ill:am gathers at Stingy Lulu's (above); the drama — James Altucher interviews an inhabitant of Alphabet City (top right)

is unique, but not uncommon, according to Kevin Dowdell, a vice president at HBO. He sees a limited window of opportunity for other IS professionals to stake out unique Web development opportunities.

"In Web programming, in the content/entertainment sense, IS skills are especially important now because we are in the incipient phase of the technology," Dowdell says. "Just as in the early days of radio or TV, in the very early stages of a technology, the point isn't just to come up with good entertainment, but also how to best leverage the technology in the face of constraints. Since we are in early stages, we look for people with this combination of technical expertise and [creative] skill sets."

"This is a perfect outlet for me because I really feel the work is boosting my creative potential," Altucher says. "There's a lot of hidden creativity in IS departments that goes untapped."

Goff is a freelance writer in New York

# On the prowl with III:am

Stingy Lulu's is quiet at 1 a.m. on a Friday. The dinner crowd is long gone, but the club crowd has yet to turn out. A small video



crew is meeting at the East Village lounge in New York's seedy Alphabet City. Its assignment: Capture the mondo bizarro of Manhattan's sleepless landscape.

Between sips of red wine chased by coffee, the crew of III.am prepares to wander Alphabet City's narrow avenues in search of stories to tell. III.am is the World Wide Web equivalent of reality TV. The program depicts the nights and times of that unique brand of Manhattanite who is out and about at 3 a.m.

James Altucher organizes the shoot, manages the crew and acts as off-camera interviewer. Just around the comer from Stingy Lulu's, he stops his first subject: 17-year-old Alice, with pierced lip and dread-locks. "Hi, we're doing a shoot for HBO. Could we ask you what you're doing out at 3 a.m.?"

He is completely undiscriminating in choosing his subjects. At 3 a.m., anyone is likely to make for a good chat, from the documentary film producer living with her subject family, to the young pool shard on her way home from a bar, to the interracial gay couple, to the three young Spaniards trying to soak up as much of New York as possible in four days.

Later, Altucher will transcribe the audio tapes, edit the videotapes, lay out the text and graphics, set it all up in Hypertext Markup Language and post another new episode to the Web site.

Not long after being threatened by a punk with a mohawk — the crew had panned the camera in his direction — the group decides to call it a night. It's nearly 5 a.m. They pile into a cab and end up in the kinder, gentler West Village. Before ducking into the Greenwich Cafe, where raging disco music will be the backdrop for drinks and breakfast, they interview a well-heeled man in a red Porsche. After a long night out, Altucher is on his way home, too.

- Leslie Goff

# http://seek-consulting.com



## Current contract opportunities available throughout the U.S.

- VC++, MFC, OLE, Win 95
- Powerbuilder, Non Visual Objects BB
- Visual Basic, Oracle
- Oracle Financials
- Oracle/Sybase DBA's
- Peoplesoft Implementations
   C, C++, UNIX, Networking
- UNIX System Administrators
- MS-Test, Automated Testing
- SOA, UNIX, Windows
- NW Management, HP Openview
- C. Assembly, PSOS
- GSM, TDMA, CDMA, FHMA, CDPD

As one of today's most highly-skilled technical professionals, you have to choose wrisely react quickly and know where to find the assignment you can sink your technino. At SER Consulting, our job is making the selection process faster and easier for high-tech contractors or booking for hungy job seekers. Running with SER you can have your choice of prime engagements with companies not part of the herd. And using SER for your hiring solutions means you! If have one of the industry's most established contract placement firms ready to strike at your command.

Pursue excellence at SEEK Consulting. E-mail your resume to jobal@sele-consulting.com or send to: SEEK Consulting Torou, Inc., Attn.: Dept. CW, 401 Edgewater Place, Suite 130, Wheefeld, MA a 1880. fax: 888-171-SEEK or for a full listing of career appartunities, visit our website. We're an equal appartunity employer.

SEEK CONSULTING

Computer Consultant (Chicago):
Computer Consultant (Chicago):
Analyze business procedures & problems of a wide variety of business & organizational clients to refine data & convert it to programmable form for electronical consultant of the consul

PROGRAMMER ANALYST Lepopningal (Refer 162798): Plan, develop, test & document compopningal (Refer 162798): Plan, develop, test & document compouter programs, applying knowledge of programming techniques as computer systems, evaluate 
user requests for new or modified 
user to develop program 
using structured analysis & 
design; convert project specification 
using structured 
in a proposition 
using structured 
using structured 
in a proposition 
using structured 
using structured 
in a proposition 
unit as yestem 
design, developguage; analysis, design, developserved 
in the structured 
in the

Computer Consultant Ji Proje.
Manager (Chicago) Analyze basiness procedures & computer systems & prepare software solutions to meet client needs. Lead 
team of 3-4 Computer Consultitation of the computer consultitation of the computer consultitation of the computer consultitation of the computer consultantitation of the consultantitation of the

Software Engineer-Oracle Specialist-three openings, 40 hrs/wk, 8am-Spm, 885,000/w; Structured openings, 40 hrs/wk, 8am-Spm, 885,000/w; Structured opening, 40 hrs/wk, 8am-Spm, 885,000/w; Structured opening, 40 hrs, 40 hrs,

Soriwara Engineer-Oraciae Specialistal-tree openings, 40 hrs/wi.

aliaist-livea openings, 40 hrs/wi.

aliaist-livea openings, 40 hrs/wi.

dayalensa analysis, design, development, testing, quality assurance, implementation, integration,
complementation, integration,
maintenance & support of large
volume online complex integrated
client/server based business,
financial, banking, manufacturing
a other commercial application
ware/multi-software environment
using centralized or distributed
database systems using Oracle
relational Database Management Systems (RIDBMS) & related
classians of the systems of the systems
and complex of the systems
and complex of the systems
continued on the systems
and complex of the systems
and complex field of the systems
and complex field of the systems
and complex field or the syst

# URGENTLY REQUIRED BY REPUTABLE COMPANY IN SAUDI ARABIA

HIGHLY QUALIFIED COMPUTER SENIOR POSITIONS

SYSTEMS DEVELOPMENT MANAGER

System Testing & Software Inspection Industrial Engineering Background Statistical Process Control Quality Control Charts & Sampling Techniques

SYSTEMS PROJECT MANAGER & SPECIALISTS
Very strong experience, provide Technical
Support to SUN/Solaris, UNIX, Sybase DBMS

Experience on SAP Implementing Team
Excellent understanding of SAP HR Module using ABAP
Oracle 7/UNIX, preferably AIX

Excellent Tax-Free salary, housing, transport, medical & other fringe benefits. These are immediate openings so FAX your resume today to:

ARABIA DATA SYSTEMS
P.O. Box 10516
Thuqbah, Al-Khobar 31952
Saudi Arabia
Fax No. 966-3-8992960
Tel. Nos.: 966-3-8647360/8641082

# Ben Franklin would be delighted.



# DST is electronically connected to over 70,000 computer terminals

around the world and uses a wide range of applications and platforms. If you are looking for a discovery to change your life, please call us.

**Analyst Programmer** 

Be a part of a team that is building a new client/server financial application using object-oriented technology methods.

Responsibilities include:

• All phases of software development including: object modeling, coding & testing

Qualifications:

• Experience with Smalltalk or C++

• Experience in client/server development is a plus

with the most functionally rich shareholder accounting and information system in the industry. DST Systems, Inc. is the nation's largest information processor for the financial services industry. Employing over 5,000 associates, including 1,000 DP, DST designs, develops and operates proprietary software systems to provide shareholder information to the mutual fund, insurance and banking industries.

For consideration, please send resume with cover letter to:

DST Systems, Inc. / Attn: Shanna Tibbetts 1004 Baltimore, 9th floor / Kansas City, MO 64105 or fax to (816) 435-8618

or fax to (816) 435-8618

Electrify your career at DST NATERIALS TO STEEL THE STREET TO STREET THE STREET THE

# A heritage A future

To get to the Fortune 50 there are no shortcuts. Anheuser-Busch has become the brewer of the two best selling beers in the country by relying on a rich heritage of nnovation, responsibility and excellence. We currently have opportunities available at several of our breweries throughout the U.S. for:

# SYSTEMS ENGINEERS

As a Systems Engineer, you will participate in the design, installation, and ongoing support of information networks, client-server applications, and process automation systems. We offer training and hands-on experience with the newest workstation and network technologies. Our plants are fast-paced, around the clock operations. If you desire a challenge and would like to engineer technology in a rapidly changing field, join our team as we install leading-edge systems in our breweries.

Qualifications include a Bachelor's degree in Computer Engineering, Electrical Engineering, Computer Science or equivalent field from an accredited college or institution. Ideal candidate will have 2-5 years experience with networked process automation systems, Allen Bradley PLCs, data acquisition, and MMI systems. C++, Visual Basic, Windows NT, FactoryLink and Intellution FIX experience preferred. Relational database and UNIX experience a plus. Relocation may be required.

If you would like to find out more about making a world of difference with an industry leader, please send your confidential resume to:

Anheuser-Busch Companies Corporate Staffing-OPER One Busch Place St. Louis, MO 63118 Equal Opportunity Employer





FIVE OPENINGS FOR SENIOR SOFTWARE ENGINEER Develop and implement designs, theratchies, memos and table interactives, memos and table interactives, memos and table interactives, memos and table of the senior of th Background must include at least two years experience in software projects using RDSMS and IN-CPMMIX on UNIX platforms. 75% travel required. 40 hour work Apply at the Texas Workforce Commission, Dallas, Texas or send resume to the Texas Work-force Commission, 1117 Trinity, Room 464T, Austin, Texas 78701, Jorden 464T, Austin, Texas 78701, Jorden 464T, Austin, Texas 78701 by an Equal Opportunity Employer.

Grup Laader, Software Engineer (Alp.) Design and develop computer testing software for practice of the control of the control

Software Engineer - PC Networking/Sys. Admin. Appl. Integration: Utilizing knowl. of networking topologies, networking topologies, networking technologies & PC architecture install, configure in manage physically works. A network operating systems. Provide user support, network troubleshooting in entwork expansion & also provide printer services also provide printer services also provide printer services coals a tempo in twans & is ware configuration; implement & execute operations. also provide printer services & back-up mgmt. Coordinate & back-up mgmt. Coordinate & back-up mgmt. Coordinate ware configuration; implement & execute operations procedures & monitor aya-provide & monitor & mon PROGRAMMER ANALYST required. Analysis, development, coding, testing & debugging of applications software on Windows & UNIX platforms using C. C.+. Oracle-7. Oracle-3. Oracle-3.

Employer.

Technical Support Specialist - client sites in metro Atlanta, GA & Co. loc in Tucker, GA. Design Object-ornetial Service Services of the Control of the Control of Services of Services and Services of Services and Services of Services o

PROGRAMMER ANALYST Australia de la construction de PROGRAMMER ANALYST - Ana

mer/Analyst required. (\* engineering field + 6 mo in software developm in software development also acceptable.) Previous exp. must include: UNIFACE; Oracle; UNIX; C. 40 hrs/wk, 9 am - 5 pm, 437,000/yr. Send resume to: Marcie Newman, HR Director, Metamor Technologies, One N. Franklin, Chicago, IL 60606. (800) 462-6301.

Programmer/Analyst (Tampa, Florida client site).
Analyze, design, develop, code, test, implement and maintain programs for commercial and financial applications systems using RPG/400 in an IBM AS/400 RPG/400 in an IBM AS/400 in an IBM AS/400 environment. Bachelor's in Comp. Sci, Engin., or Math & 2 yrs exper. in job req. \$36,500/yr; 40 hr/wk; 8:30 a.m. - 5 p.m. Send resume to: Job Service of Florida, 2312 Gulf-to-Bay Blvd., P.O. Box C, Clearwater, FL 34618-4090 Re: JO # 1479123.

# EDI

National Company is expanding and needs 15
UNIX/EDI Specialists & Mappers for exciting new projects. Contract & Permanent Positions Available throughout U.S.

Too Pay!

People Unlimited

Programmer/Analyst - Analyze, design, develop & maintain applications; corvert & upgrade existing applications. Provide user training & support. Utilize ADABAS, NAT-Provide user training & support. Utilize ADABAS, NAT-VIAL, DBIZ, SOL & CICS. No deg rqud. 4yrs/exp. in job offered. 40hrs/wk; (8-5) \$45,000/yr. Cilent sites in NC & Co. loc in Charlotte, NC. Apply to the nearest Job & Co. loc in Charlotte, NC. Apply to the nearest Job Service, So0 W. Trade St., Charlotte, NC Apply and Service, So0 W. Trade St., Charlotte, NC Apply and Service, So0 W. Trade St., Charlotte, NC Apply and Service, So0 W. Trade St., Charlotte, NC Apply and Service, So0 W. Trade St., Charlotte, NC Apply and Service, So0 D. Service, So0

# Computerworld's 1995-96 Salary **Survey** is Now Available on Disk!

What are other IS managers paying their staff?

Are you offering competitive rates?

Which industries are paying top dollar?



with Computerworld's 9th Annual Salary Survey on disk, where compensation for 28 information systems positions is covered in 21 industries.

Call today! 1-800-495-0157



Recruit top I.T. students from top I.T. Campuses!

> Issue Date: Oct. 31, 1996 Close: Sept.18, 1996



Plan Now! 1-800-343-6474, x8201 Senior Consultant. Design, develop, implement & test Enterprise Resource Planning software, including production & inventory, including production & inventory, including production & inventory, including production & inventory production with the production of the

Senior Consultant (5 positions available): Design and implementation of a Production Control System on an OSI/2 Warp using Rational Rose C++ and in an IBM Visual Age C++ programming entered with the Age C++ programming language; software to be developed for billing, shipping, one with a control of the Con

# INVESTIGATE

Project / Program Managersi Analysts - Oracle, DB2 WWW - Java, Web Masters Programmers - Cobol, IMS Visual Basic, QA, CICS

Administrators - Unix, NT reply to: A.C.Cov

PO Box 1262 Canonsburg, PA 15317 accoy@aol.com - email 412-941-2220 - voice 800-784-8776 - fax

Systems Analyst - Analyze reqs, design, develop, implement Info. Migment Systems on IBM/MVS hardware using DB2, CICS, COBOL and ADW. 40 hrs/wk; 8AM-SPM; S60,000/yr. Req. Bach. in Comp. Sci., Math or any Engineering & 2 years exp. Employer is a computer consulting firm. Relocation to various client sites for periods of 6 months 2 years is required. Service of Florida, 1001 EXECUTIVE CENTER DRIVE, ORLANDO, FL 28053-5520 Re; Job Order Number FL-1477993.

TANDEM COBOL, PATHWAY, TAL SCOBOL, C, SQL, X.25 STRATUS

MUMPS UNIX

SUN, HP, RS/6000, GUI, SDK, Noverbuilder, C++, Visual Basic Fulltime/Consulting Positions available in the US/ABROAD

STRATEM TEL: (516) 677-9800 FAX: (516) 677-1950 EMAIL: tom@stratem.

7600 Jericho Tpke Woodbury, NY 11797

COMPUTER INFORMATION
SYSTEMS MANAGER
Direct, coordinate and oversee
Programmer Analysts in the
design and maintenance of a
and residential real estate marketing, accounting, and management. Maintain computer network
with oversess office. Research
officer of new computer information technology to enhance marketing
forts. Requires an MBA with a
concentration in Business
and four years designing
and four years designing
and maintaining a real estate
database system in marketing,
and maintaining a real estate
database system in marketing,
commercial real estate. Within
the required experience, must
have four years experience in
Natural/Adabase
Database
Database
Database
Management), Netware, LAN,
WAN one year experience
and valuation; Netware, LAN,
WAN one year experience
and valuation; Netware, LAN,
WAN one year experience
of the research
of the researc

ANALYST/PROGRAMMER -From user requirements provide full life cycle design/develop-ment. Analyze, design, develop (limited), test (systems), imple-ment, document, user sup-port/training pertaining to con-version from conventional com-puting to distributed client server environment. Database & software upgrades, migration to new versions. Req Bachelor's in a Quantitative Discipline e.g. Math/MIS/Electrical/Electronic Engrng/Comp. Sc., & 2 yrs exp in job or related occupation such Lighing coling Sur. a 2 yis exp in job or related occupation such as Programmer or Systems Analysis. Exp must incl Oracli-bations. Structured Analysis. Design/Devicepment (CAS) Design/Devicepment (CAS) Diject Oriented GUI Design. A\$5,000/yr. 40hrs/wk. Mo-Fri, 9:00 am -5:00pm, Job Sites Atlanta, GA, Send 2 resumes to Georgia Department of Labor. Job Order 46A 6011993, 265-14 ML King Jr. Dr., Atlanta, GA 30311-1605 or the nearest De-of Labor Field Service Office.

ANALYST/PROGRAMMER -

of Labor Field Service Office.

Programmer/Analyst needed for Computer Consulting Firm located in Duluth, Georgia, Job duties include: Software consulting on various in-house projects and/or consulting individual control of the programment of software applications on the second of software applications. Re-engineer software applications. Re-engineer software applications. Re-engineer software applications. Re-engineer software applications. Idea RPG400, CL400, 4584 AS/400, Applicant must also have 2 yrs. of second control of the second control

Field Service Office.

Consultant. Design, develop, implement & lest software for management information & telecommunications systems. Development of a platform to provide multiplex functions for a global public network. Tools: C; C++, Assembler: ClearCase; Systime; LNINX; pSOS; Chorus; M.S. in Unix; pSOS; Chorus; M.S. in Chorus; Consequence in job offered or as Graduate Assistant required, mos. experience in job offered or as Graduate Assistant required, previous experience must include: C; C++, Graduate education must include: one course each on Assembler and Operation must include: one project with URIX; 40 hrs/wk, 9am-5pm; 450,000/y; Must have proof or-nertly in the U.S. Send resume C: Utlek, Inc., Lam: Jeff Fang, 915 Larger Rd., Ste. 350, Oak Brook, L. 60521, (600) 573-9688, REF #0826968.

Systems Analyst-Project Lead Duties will include: software development and analysis, and the de-velopment of business processes and prototypes using C and/or C++ programming on UNIX or DOS platforms. Will utilize cases. and prototypes using C and/or cheep organizing on UNIX or DOS platforms. Will utilize cases, compared to the c

Software Engineer (PeopiesOrt Specialist)-Multiple Openings Structured systems analysis, design, development, modification, and the structured systems analysis, design, development, modification, maintenance and support of large volume online complex integrated and puman resource management application systems in a multi-hardware/multiple and puman systems (TopiesOpening Software (People Software 1982), in Computer Science/Engineering/Science (or equivalent) confirmation of statistical software. B.S. in Computer Science/Engineering/Science (or equivalent) confirmation of statistical software. B.S. in Computer Science/Engineering/Science (or equivalent) confirmation of statistical software. B.S. in Computer Science/Engineering/Science (or equivalent) confirmation of statistical software and programmer Analysis Systems Analyst are required. Must have appropriate combination of statistics and proposed codes. SCR. Crystal Reports. COSIC. High mobility preferred. 40 hrs/week, 8 am - 5 pm. 48,000 - 560,000 statistics and should contact or send resume to Mr. James McCoy. s am - 5 pm. s-48,000 - 500,000 per year. Qualified applicants should contact or send resume to Mr. James McCoy Manager, Office of Employ-ment Security, 6206 Broad Street, Pittsburgh, PA 15206. Refer to Job Order # 9059571



# SUPPLY THE DEMAND.

If you've ever tried to stop water flowing from a faucet with a finger, you've felt the demand for Compaq PCs. As the Number One supplies of personal computers in the world, your talants are in demand here at Compacy, Join us. The change will do you good, You'll be working with great people at a company that's not just keeping up with the times, but changing them. All the time. Where the unique perspective of each employee forms a stream of new and innovative solutions. Supply the demand: send us your resume today

Compaq has targeted Los Angeles, Boston, Chicago, San Francisco, and Houston to be the homes of Compaq's new Enterprise Consulting Services offices. These consulting practices will focus on our critical accounts based in each city in partnership with our existing sales and support partners focated there. Permanent full-time employment opportunities are available requiring minimal travel and offering the chance to work with some of the hottest technologies and the brightest minds. We are poised for another leap within the high-tech industry. Are you?

#### IT CONSULTING MANAGER

In this position, you will provide management and leadership to our field offices by delivering innovative and leading-edge solutions that leverage our products and enterprise computing strategies into Fortune 500 companies. You will manage a highly technical IT Consultant as well as operations (expenses and headcount). Additionally, you will coordinate field activity with respective sales teams, manage client relationships, oversee multiple complex projects, develop business plans, and team with industry leading consultants and systems integrators. The ideal candidate should have an advanced degree in a business/technical-related field, 12+ years of directly related experience, and a proven track record in consulting management, services and high technology. In addition, you should possess a working knowledge of open systems and client server technologies, and you should have excellent communication and negotiation skills. An understanding of the various markets is preferred. Dept.ECS-CW-0826-CM

#### SENIOR IT CONSULTANT

The successful candidate will provide technical expertise and capabilities that enable clients to gain a measurable competitive advantage through the use of our products and enterprise computing strategies. You will conceive architectural designs for enterprise information systems, support the implementation of large and complex enterprise information solutions, assess IT needs in complex pre-asies technical environments and assist with the sales of professional services to existing and new accounts. We seek a candidate with an advanced degree in a business or technical-relate filed and a minimum of 12 years' related experience in the delivery of consulting services or in the management of information systems with a Fortune 500 MIS organization. Additionally, you should have a demonstrated technical expertise across the core competencies (OS, LANY-WANs, DBMS, Applications) and a track record that demonstrates successful "ownership" of the design and deployment of large client/server projects. Excellent communications skills and an understanding of enterprise technology to effectively represent our products, capabilities and assets are necessary; knowledge of our products and services is preferred. Dept.ECS-CW-0826-SC

Compaq offers competitive salaries, comprehensive benefits and an environment that supports creativity, open communication and team involvement. Please submit your resume and salary history TODAY, indicating Dept. of interest, to: Compaq ECS, P.O. Box 901012, Ft. Worth, TX 76101; FAX (800) 833-1466. Compaq is an equal opportunity employer m/f/d/v.

You can also access hundreds of Compaq opportunities through The Monster Board <<www.monster.com>>.



COMPAQ Has It Changed Your Life Yet?

# CONSULTANTS

MAINFRAME

DB2/CICS • Modelers
DB2 or CICS • Ideal
Natural 2 • Internals
AS 400 • Amaps
ADW or IEF • CSP

CLIENT BERVER

Another Sybase \* Testers Practe DBAs \* Visual C++ + HTML/WWA Informsts - TCP/IP - OOA/OOD Powerbuilder \* Help Desk \* Windows Win NT or 95 - SAP \* Peoplesoft After Roger Sichel 1185 6th Ave, 36th Ft, NYC 10056

http://www.roth-rogers.com/roth-rogers/ points/www.roth-rogers.com/roth-rogers/ points/www.roth-rogers/ Fax 800-770-6390 or R. Michaels A 1451 W. Cypress Creek Rd Crown Center, Suite 900 954-489-2700 Fax 954-489-6474

NATIONAL CONSULTING **OPPORTUNITIES** 

IEF/COMPOSER (Block Mode) IEF/COMPOSER (Client/Server) SYBASE DBA DB2 DBA

Send Resume or Fax to: Powers Case Consulting Services. Inc.

8131 Southwestern Blvd. Suite 101 Dallas, TX 75206 Att: Midge Powers Fax: 214-987-9373

## ANALYST/ SAS PROGRAMMER

Meredith Corporation's Data-base Research Department database of over 60 milion cus-tomers. Candidate will be principally responsible for SAS pro-gramming in support of market research projects. Department activities will include developing activities will include developing mail promotions, profiling cus-tomers and implementing data-base marketing projects.

Position requires a Bachelor's degree in Computer Science, Math. Statistics, or equivalent and SAS programming experience. Experience working in a ronment a plus. Strong analytical skills and attention to detail, the ability to develop logical and practical solutions, and solid oral and written communication skills are required.

Location: Des Moines, IA

Please send resume and cover letter with salary history in confi-dence to:

Mrs. K. Bock, Supervisor, Corporate Staffing Services/Dept. 162

Meredith Corporation

1716 Locust Street, Des Moines, IA 50309-3023 fax: 515-284-2958 or e-mail: kbock@dsm.mdp.com An Equal Opportunity Employe

# apg-us/

An Open Systems & Client Server Integrator with offices in the US & Canada, has multiple openings (100+) for SYBASE, ORACLE, INFORMIX, DB26000 requirements:

DBA - SQL optimization and standardization. Physical optimization including device, table, index and server cache management. Backup & Recovery. Capacity Planning: System 10 & 11; UNIX (Solaris or HP-UX) or NT experience.

DATA MODELLER - Application development Data Modelling experience SQL89 compliance, stored procedures, and triggers. Responsibilities include: User development sessions, developing data models and transaction models.

REPLICATION SERVER MGR - Assist in development, implementation and management of Enterprise-Wide Replication Server Implementation. Excellent base salary, bonus, and benefits. Resumes to P. Marsh:

# APG-USA

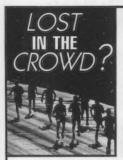
One Appletree Square, #1048 Bloomington, MN 55425-1609 800/286-6072 FAX: 612/851-9731 e-mail: APGUSAMN@AOL.COM

# **ACQUISITIONS WANTED** We are looking for a computer consulting firm to acquire. Fast closing. Distressed firms are no problem. Will consider an equity investment or financing. Contact: Laura Ponsford



JUST TECHNICAL ASSOCIATES Plaza of the Americas 600 N. Pearl, Ste. 370 Dallas, TX 75201

Ph (800) 777-2738 Fax (800) 777-2714



# Be SOMEBODY.

At Information Management Resources, Inc. (IMR), our consultants are valued and respected for their unique individual contributions. As an enterprising U.S.-based international software services company, we provide multiple consulting services to a world-wide Fortune 500 customer base in critical areas such as new development, applications management and outsourcing, and migration services (including Year 2000 conversions). Talk with us about the following:

# IMMEDIATE U.S.-BASED OPPORTUNITIES!

Technical Project Managers/Leaders
 Systems Analysts
 Programmer/Analysts

All opportunities require multi-piatform experience in one or more of the following: MAINFRAME: IBM-MF, DB2, IMS-DB/BC, COBOL, COBOL II, CICS, APS, IDMS, Adabas Natural; CLIENT/SERVER/PC TECHNOLOGY: C++, C, UNIX, ORACLE, ORACLE 2000, SYBASE, Powerbuilder, Windows-NT, Visual Basic, IEF 5.3/5.2, OOD, GUI and SOL.

# INTERVIEWS ARE NOW BEING SCHEDULED

To set-up an interview appointment for opportunities in the United States,

please fax or e-mail a resume to John B. Nyhan, Vice President of Recruitment, INFORMATION MANAGEMENT RESOURCES, INC., 26750 U.S. Highway 19 North, Suite 500, Clearwater, FL 34621-3442, Fax (81.3) 791-8152, E-mail to nyhan@mrusa.com. Principals only need apply. Equal Opportunity



A Leader In A Time Of Change

• Clearwater • Boston • Chicago • Dallas • London • Bangalore, India •

Senior Systems Analysis to analysis, design, develop, set, implement, enhance, and support large scale clein-tearver system for covering the full tile cycle of motor vehicle engine development, covering the full tile cycle of the control of the c

We specialize in: The placement of SAP

professionals - all modules. ABAP, BASIS.

ontract & Permanent Positions Available Nationwide. We have low overhead so we can pay you top rates.

People Unlimited
1811 Sordis Rd. N

Software Designer, 40 hrs/wk, 8am-5pm, \$54,000/yr, Design, development, implement & test applications in multi-layered, client/server distributed computications in multi-layered, client/server distributed computications (server) and server desirable and server development. Development of code generator tool. Tools: DCE; INGRES: SQL; C/Ce+; X-Windows: Interprocess Communications (RPC); Informix, M.S. in mos. experience in the job offered or as Programmer/Analyst required, Previous experience rusui include: development of code generator tool; interprocess communications (RPC); relational databases, informic; SQL; C/Ce+, 7310 Woodward Avenue, Rm. 415, Detroit, MII 48202. Ref. #98296. Employer Paid Ad.

svisuse. Employer Fraid Ad.

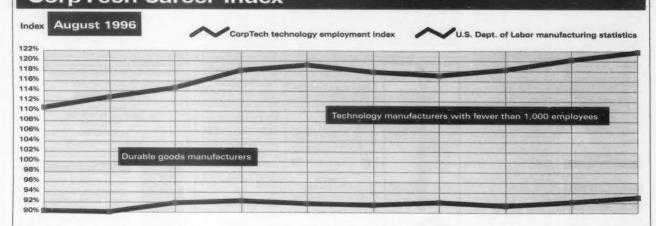
Software Engineer, 40 hrs/wk.
Sam-Spm, S38,855/yr. Design, devellop, code & test software for
vellop, code & test software for
vellop, code, 8 test software for
vellop, code, 8 test software for
vellop, code, 8 test software for
bellop, code, 8 test software for
powerbuilder, MS-Access, MS, In
Sauc, Visual C-+-: Excelerator;
Powerbuilder, MS-Access, MS, In
vesp, in job offered or as Programmotuder. UNIX. C; C-+-: COBOL;
CRACLE; AlON; Visual Basic;
Visual C-+-: Excelerator;
Visual C-+-: Excelerator;
Powerbuilder, MS-Access, Must have
estimated to the complete of the c

2 Systems Analysts - Arralyza user requirements, design, develop and implement information Management Systems on IBMMWS hardware using DB2, CICS and COBOL. Requires Bach in Comp. Sci, Math or any Engi. degree and 2 yrs exp. Employer is a computer consulting firm. Relocation to client sites for periods of 6 mos to 2 yrs exp. Employer is a computer consulting firm. Relocation to client sites for periods of 6 mos to 2 yrs exp. Employer is a computer consulting firm. Relocation to client sites for periods of 6 mos to 2 yrs. Sci. 2000 yr Sci. 2000 yr

# http://careers.computerworld.com



# CorpTech Career Index



August

October

December

**February** 

April

June

Copyright 1996, Corporate Technology Information Services, Inc., Woburn, Mass.

April

June

February

1995

December

1994

COMPUTERWORLD ampus Edition

Recruit top I.T. students from top I.T. Campuses!

> Issue Date: Oct. 31, 1996 Close: Sept.18, 1996



Plan Now! 1-800-343-6474, x8201

# INFORMATION SERVICES

Shelter Insurance companies have openings for various Information Services positions in Sneiter instifance companies have openings for various Information Services positions in Columbia, Missouri. A colleg degree in Computer Science is preferred for all positions. Accompanying the starting pay is an excellent benefits package, Starting salaries will be commensurate with education and experience.

## **ANALYSTS**

The position requires 2 years of experience in applications analysis, design and development accompanied by strong planning, testing and problem solving skills using COBOL, and IMS systems.

## SYSTEM PROGRAMMER

The position requires 2 years MVS Systems Programming experience in MVS/ESA/JESQ Operating System planning, implementation and maintenance, with familiarity in the DFSMS functional product set. Specific education or experience in CICS/ESA, IMS/VS/ESA or DB2 subsystems would be harmfelial

If interested, send resume and salary history to:

**Shelter Insurance Companies** 1817 West Broadway Columbia, MO 65218 Attn: Melody Marcks

An Equal Opportunity Employe



develop, test & document computer programms applying principles of programming flichtingues and program to determine fleasibility were considered to the programming flichtingues and program to determine flightly were considered to identify current operating procedures & clarify program objectives; formulate plan outlininggram, using structured analysis & design; convert project specifications, using flicktingues and programs, into sequence of detailed grams, into sequence of detailed coding into language process able by computer; apply knowledge of computer programming techniques & computer into the programming of the programming of the programming of the programming system; process flow, and the programming system; programmer computer software flowers, and the programming system; programmer, design, develop & imperient on-line and the programmer computer flowers of the programmer computer flowers of the programmer computer flowers fl

Database Analyst: Uses principles of higher mathematics and implement and revies a large data set (over 1,000 GB) Oracle might and revies a large data set (over 1,000 GB) Oracle relational database management system. Performs data manipular transmission performance including writing of dynamic ESGLIC search engines in a UNIX eminoment for implementation in activation. Will use PL/SQL (a form of Transaction SQL) to enlarge data standards and formatting of SQL for customization purposes. Statistion. Will use PL/SQL (a form of Transaction SQL) to enlarge data standards and formatting of SQL for customization purposes. SQL for customization purposes applications using RPC to communicate between remote access system of various configurations including modification of calculations applications using principles of mathematics to develop appropriate systems architecture for purposes of database systems configuration using principles of mathematics. Uses principles of atteits of develop appropriate systems and other mathematical calculations and other mathematical calculations. Also requires sist monities experience and configuration of the principles of mathematics and calculations. Also requires sist monities experience as a politication of the performational requirements of end users. Requires Master's degree in Computer Science. Also requires sist monities experience as a politication of the principles of the princi

Programmer Analyst to design and write applications in Microsoft Access and MS Visual Basic for accounting and scheduling software. Novell and Windows for Workgroups Network Administration and troubleshooting. Inhouse technical support and provide training to other programmers. Computer Science plus 1 year experience in programming and network administration. ("One academic year in graduate coursework in Computer Science size sequipalment to one year related work in Computer Science is equivalent to one year related work experience, \$32,000 - \$37,000/yr. 40 hrs/wk. Send resume to. Nebraska Job Service, 550 South 16th Street, P.O. Box 94600, Lincoln, NE 68599. Refer to Job Oxder No: NE 0167978.

Several consulting positions in Ohio. NJ, & Florida. Top salaries, benefits & relocation. EOE.

ellocation. EOE.

UNIX/C++/C/java, CORBA

System Englineers,
Network Mignit., Telecom

Intranet Security, RSA,
Radius, Kerberos, X:509

PDM, Manufacturing, Sherpa

CDPD, Cellular, Tuxedo,
Billing Systems

RE, Microwave, DSP, H/W test

 Nr, MicDoware, DSF, Hyw testing, QA, Cust. Support
 Quality, TQM, QMF, PMT, ISO 90
 ATM, TMN, CC57, AIN,
 CMIP/CMISE
 IVR, CTI, Voice Mail s/w devipt. IESS

816 Morrison Rd., Gahanna, OH 43230, Fax: 614-751-2008



# **DON'T MISS OUT** ON THE FINER THINGS LIFE HAS TO OFFER! IOIN RYDER IN BEAUTIFUL SOUTH FLORIDA TODAY!

When you align yourself with Ryder, you are not only joining a Fortune 250 company with \$5-billion in revenues, you are working with a top-notch team, redefining the leading-edge of technology. Our tremendous growth has created immediate opportunities for creative, customerfocused Information Technologists. Be part of shaping the future of the booming logistics industry in one of these immediate openings:

DATA WAREHOUSE/DATABASE ADMINISTRATION/DATA ADMINISTRATION Using CASE tools and a variety of DBMS

APPLICATIONS DESIGN/DEVELOPMENT

Full software life-cycle development using a variety of tools including COBOL/DB2, IMS DB/DC, Powerbuilder/Visual Basic, C/UNIX/DBMS, RPGIII, GUI/Windows, etc.

**TEAM LEAD/SYSTEM ANALYST** 

Full software life-cycle development with lead or senior analyst responsibilities.

**TECHNICAL SUPPORT** 

of platform and levels of responsibility: IBM Mainframe, IBM Midrange, Client/Server/LAN, UNIX/AIX, LAN/WAN, Communications.

PROJECT MANAGEMENT/METHODOLOGY Planning and managing project and human resources to drive software and cross

functional implementation projects.

TECHNOLOGY ASSESSMENT/ARCHITECTURE/MODELING Enterprise wide assessment, research and integration of information technology.

PROJECT/SOFTWARE IMPLEMENTATION/DEPLOYMENT Deployment of new systems to support either internal or external customers.

Ryder is known as an employer of choice and offers superior compensation and generous benefits including RELOCATION ASSISTANCE and growth potential. And the South Florida area is known for its cultural diversity, fine dining, and beautiful beaches. With this combination, you can't lose! For immediate consideration, please send your resume to: RYDER SYSTEM, INC., Attn: Dept. HQHR/PG, 3600 NW 82nd Avenue, Miami, FL 33166.

# ADDITIONAL OPPORTUNITIES EXIST FOR INFORMATION SYSTEMS PROFESSIONALS AT RYDER!

For complete descriptions about the above positions and additional openings, please see our sites at the following locations on the internet:

> http://www.ryder.inter.net/ryder http://www.occ.com/ryder/



Together, We're Going Places

An Equal Opportunity Employer. Drug testing is a condition of employment with Ryder.

company. Duties include ment of the planning, mo and executing the efficient implementation of implementation of includes the company of the and implementation of interface conversion programs, release changes and modifications to the Systems, Application and Products in Data Processing (SAP) in the modules of RIM-LVS, RIM-MAT and interface accessing the RV, RIM-PPS and RIK module. Development of period order procession in SAP 

# SCOTT & WHITE TEMPLE, TEXAS

One of the nation's largest multi-specialty medical centers, located in central Texas is actively recruiting qualified candidates for the following positions:

To the releasing loss senior Systems Analyst Programmer (SWHP) - Bachelor's degree in computer science or comparable field, or equivalent experience. One year experience on HP3000 using MPE and Image. Three years CoBOD, programming, One year systems analysis and design. Experience in HM0 environment or Amisys software a plus.

Programmer/Analyst (SWHP) - Bachelor's degree in computer ence or comparable field, or equivalent experience. Working knowledge of HP3000 using MPE and Irrage. Two years C0B0L program ming. Experience in HM0 environment or Amisys software a plus.

We offer an excellent benefits package, competitive salaries, some relocation assistance and ideal living conditions in the sunbelt with easy access to major cities. Qualified applicants send resume with salary history to: Scott & White, Human Resources, 2401 S. 31st St., Temple, Texas 76508; Fax (817) 724-1631; WWW: http://swinfo.tamu.edu/jobs EDE

PNC BANK, one of the nation's largest financial institutions, is seeking an experienced professional who can provide leadership and operational support to optimize the staff and technology resources of PNC Bank Data Center Operations to consistently meet and exceed business requirements.

# GENERAL MANAGER Data Center Operations

The candidate we seek will have the demonstrated ability to work with all levels of personnel to develop, recommend and implement complex technology solutions in order to satisfy long-term strategic business objectives.

Requirements include a B.S. in CS or MIS, and at least 12 years experience in progressive systems and/or operations management. An advanced degree is preferred. Demonstrated project management, staff leadership, analytical, planning, problem-solving, and communication skills are essential.

Other positions available within Information Technology Services include:

Technical Services
Distributed Computing Support
Data Management/Data Warehousing

For consideration, forward your resume to: PNC Bank, Human Resources, Dept. P2-PTPP-11-1, 520 Liberty Avenue Pittsburgh, PA 13265. FAX: 412-762-8816. No Phone Calls Please. For more information about PNC Bank, visit our Website at <a href="http://pncbank.com">http://pncbank.com</a>

PNCBANK

# Resumes Direct

DUR CLIENTS ARE HIRING NOW

Minneapolis GE CAPITAL FLEET SERVICES - GRACO

NASH FINCH COMPANY - THE ST PAUL COMPANIES

MALCO PRODUCTS, INC - COMPINARE CORPORATION
ITT HARTFORD LIFE AND ANNUITY INSURANCE COMPANY

Cleveland (EASEWAY LOGISTICS - MANCO, INC.)

ALL HARDWARE, SOFTWARE & NETWORK POSITIONS

DeCARLO, PATERNITE AND ASSOCIATES, INC.

One Resume Multiple Opportunities

Fax: 800-417-7540

e-mail: resumes@megalinz.net web site: http://resumesdirect.com

SYSTEMS ANALYST: (F
Wayne, Indiana): Design (

Database Analyst: Designs, develops, and modifies relational database system installed in a Brireve environment using C and database system installed in a Brireve environment using C and SCI, clients/ever to insure accultricuply various communication networks consisting of real time financial security quotations in control of the cont

Was take mpc/resumeasureccom/ Wayne, Indiana): Design and develop new programs, evaluate the computer system up and running, work with Data Processing Manager to establish and generate training material, assist other employees in learning computer employees in learning computer employees in learning computer accuracy of new programs and accuracy of new programs and print projects and carry out special computer projects, perform and mantain libraries for system with Pick Basic, Fortnar, Unix, SAS, DOS and window computer languages etc. 40 hrs/wk, 6:00am to 5:00pm, 8-40,000 per year. Bn Degree in Electrical Engineers (Workforce Development, 10 N. Senate Avenue, Indianapolis, IN Blancaneaux, IDJ# 3379759

Technical Reculsar Client Coordinator (Dalas T.O), Recruit, Interview & evaluate candidates for contract & permanent information technology positions outsourced to multinational selecommunications understanding selecommunications. Interview & evaluates staff performance, Prepare & present service proposals. Apply Interview of original technology and the contract of the contract o

# http://careers.computerworld.c





# Learn Technical Recruiting from the Experts!

If you recruit Information Systems talent and want

to get expert advice, you'll want to order the complete proceedings from Computerworld's 1996 Corporate Technical Recruiting Conference, held June 2-5 in suburban Denver. For just \$49 plus \$3.50 for shipping and handling, you'll receive this 92-page book containing selected papers on subjects including proactive recruiting techniques, industry trends, advancing your career, applicant tracking systems, immigration, and reengineering. And all papers are written by experts, so you're sure to learn from top presenters in the field.

To order your copy, simply fax or send the coupon below. But hurry, because supplies of this one-of-a-kind tool are limited!

To REGISTER for the 1997 conference or to ORDER the 1996 proceedings call 1-800-488-9204 or use this coupon today!

# Fax this coupon to: 1-508-620-9430

Or send to: Computerworld, c/o Price Lampert Associates, 500 Old Connecticut Path, Framingham, MA 01701

- ☐ Please rush me the 1996 Conference Proceedings.
  - I've enclosed my check for \$49 + \$3.50 for shipping & handling, or to pay by credit card please call 1-800-488-9204.
- □ Please □ send or □ fax me information about the 1997 Corporate Technical Recruiting Conference to be held June 8-11, 1997 at the Marriott Rivercenter Hotel, San Antonio, TX.
- Please register me and send me an invoice.

NAME\_\_\_\_\_\_

COMPANY

Address \_\_\_\_

CITY\_\_\_\_\_STATE \_\_\_ZIP\_\_\_

PHONE \_\_\_\_\_FA

# This Web

e-mails you with the career opportunities you want.



http://careers.computerworld.com

itCareers. Where the careers find you.

Research & Development Projects



for simulator projects uble-shoot difficult soft-

Forward resume, 3 references, & a description of recent work to: Forward resume, 3 references, & a description of recent work to: Search Committee-Manager RBA Projects, CCAD, 208 Engineering Research Facility, The University of Iowa, Iowa City, IA 52242. Equal Opportunity/Allimathe Action Employer: Women & minorities are encouraged to:

We are in our 11th year of providing quality service to Fortune 100 and government clients NOLA throughout the South. NOLA offers competitive compensation and comprehensive SERVICES paid benefits. We are seeking professionals

ith experience in any of the following

Analyst Positions

System implementation experience including:

- PeopleSoft General Ledger, Payables, Receivables

- Oracle Financials

System design and analysis tools
 Project management

Technical Positions
PeopleSoft - PeopleTools
PeopleSoft - PeopleTools
Oracle 7.x (DBAs and Application Developers)
PowerBuilder 4.x with Oracle 7.x or Sybase

Oracle Financials IMS DB/DC with COBOL II

end your resume to: NOLA Computer Services, Inc., 1100 Poydras St., Suite 1250, New Orleans, LA 0163; Toll Free (800) 347-1670 Fax (504) 585-3760 E-mail: nola@mailhost.accesscom.net

Idelwork (Software) Engineerpowerlops, modifies and meintains a UNIX based network comtains and tains and tains

Systems Analyst - Ann Arbor, MI - Analyze require-Arbor, Mr. Analyze require-ments, design and modify information management systems on IBM MVS/ESA hardware using COBOL II, DB2, CICS and REXX. DB2, CICS and REXX. Write program specs. and sys docs. Enhance/debug existing systems and progs. Requires Bach. in Comp. Sci. or Comp. Engi. and 2 yrs exp. M-F, 8AM-5PM, 40 hrs/wk, \$5,000/ mc. Send resumes to 7310 Woodward Ave., Rm 415, Detroit, MI 48202, Ref #102496 Systems Analyst: Creates, develops, modifies, tests, and implements Assembler, PL/I programs, and JCL using VSAM/GSAM/ in an IBM S370 MSAM/GSAM/ in an IBM S370 modifies computer software problems and develops solutions for such software systems using lesting tools such as SMAM/ESAM and SMAM/EST and ment of source modules version software to insure appropriate modification and implementation of source modules version software to insure appropriate modification and implementation of source modules version software to insure appropriate modification and implementation of source modules versions and implementation of source modules version in source and implementation of source modules versions in the condition of system requirements, design programs. Performs full cycle reviews and development of new module systems including analysis of system requirements, design programs. Performs full cycle reviews and development of new module systems including analysis of systems recipiered in the included and systems recipiered in the included complettion of a Systems Programming course in which his individual VSAM/GSAM in an IBM S370 Engineering, Education to include completion of a Systems Program-completion of a Systems Program-used Assembler language in a VSAM/OSAM in an IBM S/370 MVS environment. Education to include completion of one course include completion of a business report Education to OSAM file using subroutine to process amater file for designing of a business report Education to in which the individual coded in JCL for implementation and annipulation of macros for OSAM and VSAM files. Education to in which the individual performed multi-fasking using QSAM and SAM Hours 9:00 a.m. 45 500 pm. 45 hours per week at \$46,000 pm. 45 hours per

# COMMITED TO GLOBAL GROWTH - AND OUTSTANDING CAREERS.

At Textron Automotive Company, we're rec-ognized as a premier full-service supplier to global growth by utilizing the latest technologies and the world's best technical professionals. That's where you come in.

**Systems Development Specialist** You will be responsible for the development of new manufacturing and Business Application Systems through the development of function-al system applications, system test plans, user training programs and procedure manuals.

To qualify, you will need at least 3-5 years of working knowledge with the CMI TRANS4M product and be able to work effectively in the Unidata environment with knowledge of Unibasic and Uniquey. Excellent communication skills are essential. We also require a business background in financial and/or manufacturing. Ref. #96-18

**HR Database Specialist** 

You will be responsible for providing technical and organizational leadership for the company's PeopleSoft HR database environment. This includes overseeing the development and organization of the databases, as well as the organization of the databases, as wen as the assessment and implementation of new tech-nologies. You will also provide information Services with a long term perspective on the relationship of HR database technology to the business opportunities facing the company.

To qualify, you should have a BS degree in Computer Science or a related field. We also require at least 5 years of IS experience - 3 with relational databases and transaction processing systems - preferably in the PeopleSoft environment. Ref. #JJ-2.

**EDI/Communications Supervisor** 

In this position, you will coordinate and manage all EDI and WAN operations, maintenance, planning, security, and applications for the Interiors Division. ance, planning, security, and applications for e Interiors Division.

At least 3-5 years of EDI experience is essential. We also require knowledge of hardware and software relating to the EDI environment. In addition, you will need knowledge of Frame Relay, Ethernet and Pathworks. CMI EDI software understanding is important. Ref. # 96-188.

We offer an excellent salary and benefits package. For prompt, confidential consideration, please send your resume and compensation expectations to: TEXTRON AUTOMOTIVE COMPANY, Ref. # \_ \_ 750 Stephenson Hwy, Troy, MI 48083. We are an Equal Opportunity Employer.





# Software Professionals

Computer Data Systems, Inc. <sup>8</sup> (CDSI), a premier information syst pany, has immediate openings for software developers, engineers, programmers & configuration mngmnt, analysts & other related po

Most positions require a related BA/BS & skills &/or related exp. in one more of the following:

Kansas City, MO (includes Omaha, NE & Quantico, VA area) - Natural/ Adabas, JCL, UNIX, FORTRAN, OS/2, SABRS training, Oracle Forms 4.5, Computer Based Training Development with PC Graphics

New Orleans, LA - Mapper Programming Language, GIS, ARC/INFO, Oracle v7, Client Server, Intergraph, GUI

Denver, CO (includes FL Collins, CO. Salt Lake City, UT, Dugway, UT, & Colorado Springs, CO area) · C, C↔, Visual Basic, FoxPro, UNIX, Vermont Views, Informix, FERL, HGML, Multi-Media, FOLIO, X-Windows, Oracle v7, Helip Desit, AutoCad

San Antonio, TX - Sybase, Help Desk, Word Processing, Oracle DBAs. COBOL, Honeywell, Barryan Vine Administrators, USAF Samuel Edit System Specialists, UNISYS, Win-NT, C++, C, UNIX, LAN/WAN. System Speciali Oracle v7, SAS

CDSI offers a competitive salary & a full range of benefits. For consideration, send resume to:

Attn: H.R., Dept. 3354 810 Houston St., Ste. 650 Fort Worth, TX 76102 Fax: (817) 335-3631 Specify job & location preference. EOE M/F/D/V

# COMMITTED TO GLOBAL GROWTH - AND OUTSTANDING CAREERS.

At Textron Automotive Company, we're recognized as a premier full-service supplier to the automotive industry. We're committed to global growth by utilizing the latest technologies and the world's best technical professionals. That's where you come in.

**Systems Development Specialist** 

You will be responsible for the development of new manufacturing and Business Application Systems through the development of function-al system applications, system test plans, user training programs and procedure manuals.

To qualify, you will need at least 3-5 years of working knowledge with the CMI TRANS4M product and be able to work effectively in the Unidata environment with knowledge of Unibasic and Uniquery. Excellent communication skills are essential. We also require a business background in financial and/or man-ufacturing. Ref. #96-18

## **HR Database Specialist**

You will be responsible for providing technical and organizational leadership for the compaand organizational leadership for the compa-ny's PeopleSoft HR database environment. This includes overseeing the development and organization of the databases, as well as the assessment and implementation of new tech-nologies. You will also provide information Services with a long term perspective on the relationship of HR database technology to the business opportunities facing the company.

To qualify, you should have a BS degree Computer Science or a related field. We also require at least 5 years of IS experience - 3 with relational databases and transaction processing systems - preferal environment. Ref. #JJ-2. preferably in the PeopleSoft

**EDI/Communications Supervisor** 

In this position, you will coordinate and manage all EDI and WAN operations, maintenance, planning, security, and applications for the Interiors Division.

At least 3-5 years of EDI experience is essential. We also require knowledge of hardware and software relating to the EDI environment. In addition, you will need knowledge of Frame Relay, Ethernet and Pathworks. CMI EDI software understanding is important. Ref. # 96-188.

We offer an excellent salary and benefits package. For prompt, confidential consideration, please send your resume and compensation expectations to: TEXTRON AUTOMOTIVE COMPANY, Ref. # \_ , 750 Stephenson Hwy, Troy, MI 48083. We are an Equal Opportunity Employer.

TEXTRON Automotive

PROGRAMMER/ANALYST to design, develop, test, analyze and implement Data Conversion client/ server systems for Human Resource and Psyroll activare products. Utilize PC Communication implement communication system to transfer the data acquired from Data Conversion source (multiple platforms) system to Maintfarms databases. Use objected-orient-tools such as CIC++, MS-Windows, Visual Basic. PMS-Windows, Visual Basic. PMS-Windows, Visual Basic. PMS-Windows, Visual Basic. Politonion on multiple platforms, including on multiple platforms. bluider, MS Access and MS Excel, on multiple platforms, including MS-DOS, Windows, UNIX, Noveil Netware and LAN Require; MS. in Computer Science with a demonstrated ability (gained through previous experience/academic coursework) in software development in Data Processing and Data Communication using object-oriment in Data Processing and Data Communication using object-oriented/multiprocessing development tools on multiple compent tools on multiple compent accounts of the communication of the compens of the communication of the communication of the communication and interface design, and database design and management. Salary: \$39.600 per year, 8 am to 5 pm. MF-R Apply by resume to 3 pm. MF-R Apply by resume to 3 pm. MF-R Apply by resume to 5 pm. MF-R Apply

Project Director of Global SAP Implementations, Allanta, Manage the SAP consulting practice. Develop software consulting practice. Develop software consulting practice provides & strategies, identify new strategies, identify new strategies, identify new strategies, and strategies, identify new strategies, and strategies, identify a subject of the project of the strategies of SAP systems & submatistion of business processes, in addition to SAP systems & submatistion of business processes, in addition to SAP systems & project plans. Manage profitability of the practice, prepare budget, hire & fire personnal, & implementation support, and the strategies of the strategies o

# Computerworld's 1995-96 Salary Survey is Now Available

on Disk!

What are other IS managers paying their staff?

Are you offering competitive rates?

Which industries are paying top dollar?



**Answer these questions and more!** 

with Computerworld's 9th Annual Salary Survey on disk, where compensation for 28 information systems positions is covered in 21 industries

# Plus!

The Disk also includes Computerworld's first survey ever on hot skills. Find out the premiums IS managers are willing to pay for specific IS skills. Which skills are in the highest demand? Which industries are willing to pay top dollar for them? You'll find over 60 technology skills listed which include development tools, languages, operating systems, networking and internetworking equipment, RDBMSs and more. All are broken out in 14 industries and in 12 metropolitan areas.

All this for just \$299.

Call today! 1-800-495-0157

COMPUTERWORLD ampus Edition

Recruit top I.T. students from top I.T. Campuses!

> Issue Date: Oct. 31, 1996 Close: Sept.18, 1996



Plan Now! 1-800-343-6474, x8201 PROGRAMMER ANALYST [2 openings] (Ref#: 93996): Plan, develop, test & document computer programs, applying knowledge of programming techniques & computer systems; evaluate user requests for new or modified appropriate for determine, feasibility. & computer systems; evaluate user equests for new or modified programs to determine feasibility, with current systems, and the description of the the following: data ransiyas: denthyling potential problems for data 
conversion, gathering requirements, design, develop, test 
mathrain data cleanup & data valments, design, develop, test 
mathrain data cleanup & data valments, design, develop, test 
mathrain data cleanup & data valments, design, develop, test 
solidari data design, data valtest 
solidari data design, data valsolidari data design, desig

software Engineer-Legaty
Systems - WA Computer:
Structured systems analysis,
design, devlym't testing,
implementation & integration of
complex online transaction processing distribution,
systems in a multi-hidware
waystems in a multi-hidware
multi-livare environ. incid'g
VAX cluster & VAX workstations using file systems, relations using file systems, relations using file systems, relations and systems in a multi-hidware
multi-livare environ. incid'g
VAX cluster & VAX workstations and systems, relations and systems, relations and systems, relafile of the systems of the systems
pages & CUI (Graphical User
systems & migration of legacy systems & client-server
systems & migration of legacy systems in client-server
systems analyst
systems snalyst. Must have
appropriate combination of
8; or 2 of A. & 2 of B. A
includes DBMS: Rdb, Oracle,
Sybase; B includes: DECforms, DECdesign, CDDe,
Pathworks, PowerHouse, KWindows/Motif, Digital Unix,
RMS. High mobility preferred.
40 having: \$49,005-980,000
Y, Reply to Vince Beaserich,
Security, 245 Fifth Ave.
McKeesport, PA 15132. JO
#B013494.

ANALYST/PROGRAMMER - Meet with client management to avaluate software needs pertain-variance of the control of ANALYST/PROGRAMMER

PROGRAMMER ANALYST [2 openings] (Refe: 102896); Plan, companya] (Refe: 102896); Plan, companya

ous

eapo

ami

napo

Aus

nta

lew J

Aus

WORLDWIDE IMPLEMENTATIONS **ALL MODULES** nctional • Technical ABAP • BASIS Positions throughout the U.S.

Structured Logic Company, Inc.

5500 Interstate N. Pkwy. #450 Atlanta, GA 30328 800/599-9550 FAX: 770/937-0423 e-mail: slc11@aol.com EOE MEMBER NACCB

CONTRACT & PERM. OPPORTUNITIES!

EN-DATA CORPORATION is cur rently recruiting I.S. pros for contract and perm positions. The following is a small listing of available positions:

Dun & Bradstreet's M & E Series (M&D or MSA), Sma stream/Client Server a +
- Consult & Perm, PR, HR, FA,

- Consult & Perm, PR, HR, FA Gl., etc. As400/COBOL, AS400/ RPG400 COBOL, CICS, OR DB2 COBOL, CICS, OR DB2 COBOL OR COBOL II AS400/ED/Preminos ORACLE Developers DELPHI Developers DELPHI Developers The Developers or II PeopleSoft Consultants



Not all information technology services companies are created equal CIBER has the record of success that puts us at the top. We have offices in major cities across the country, and we've experienced a 60% increase in net income and over 40% in revenue for 1996. We now have over 1800 technical professionals on staff. We've also been named one of the world's best small companies by Forbes Magazine for two years in a row. It's the kind of performance you would expect from a leader in information systems technology you can help us maintain our success by exploring one of the outstanding mainframe career opportunities we currently have available

We have recently been awarded multiple major outsourcing contracts across the country from Fortune 500 companies, that include, but are not limited to:

**COBOL** Conversions Re-engineering efforts Millennium Date Change Projects

We have immediate career openings for:

COBOL Application Developers (experience with CICS, DB2/IMS or Natural/ADABAS is a plus)

In the following cities

· CHARLOTTE • DENVER

· TAMPA

· ST. LOUIS

• ORLANDO · SPRINGFIELD IL

a (and others)

We have open positions in our organizational structure from Jr. Level Programmers to Sr. Project Mgrs. We will train entry level candidates with a C.S. or related degree and strong initiative.

as a stimulating work environment. For consideration and benefits packages, as well as a stimulating work environment. For consideration, mail or fax your resume to: CIBER National Recruiting, Dept. CCW, \$251 DTC Plwy, \$41450, Englewood, CO 80111. Phone: (800)669-0401 or Fax (888)804-0927. E-mail: ciber@mi.net EOE

THERETIME

Come join the world-class team of

Micron Custom Manufacturing Services, Inc.,

where you will live in the beautiful Boise, Idaho area.

We are a principal leader in contract electronics manufacturing and have LS.

opportunities for our Idaho facility.

# **INFORMATION SYSTEMS**

INFORMATION SYSTEMS MANAGER:

Experience in management of major system conversions or major system upgrade projects. B.S. in Computer Science or equivalent experience required. 5 to 6 years experience in business/systems analysis with strong emphasis on process improvement. Prefer experience in electronics manufacturing or contract manufacturing environment. CINCOM 7.0, Oracle or Client/Server experience a plus.

SOFTWARE DEVELOPER:

S - S years LS. experience, preferred. Degree in Computer Science, Computer Information Systems or related field. Knowledge of Visual Basic and Oracle 7. Good understanding of SQL and development methodologies. Cobol and/or Userbase, and manufacturing knowledge a plus.

B.S. in Computer Science or equivalent experience required. 5- years in business/systems analysis with strong emphasis on process improvement. 3- years experience leading medium to large-scale projects within an ORACLE arena. Working familiarity of MS Windows, CASE, WAX VMS, and Visual Basic a plus.

DATA ARCHITECT:

Experience in Data Modeling, development cycles, standard diagramming techniques, documenting business rules, Oracle, RDBMS, Client/Server development.

SYSTEM ADMINISTRATOR

AA in Computer Science or equivalent. 1-2 years experience in UNIX utilities and commands. Good working knowledge of C programming/scripting, Novell, NT, DOS Windows, X Windows and network design experience a plus.

We offer competitive compensation and benefits package.

Relocation assistance is available.

For immediate consideration, please fax your resume to 208-368-2789 mail to Micron Custom Manufacturing Services, Inc., 8455 Westpark Street, Boles, ID 83704 or E-mail your resume to PBARBER@MICRON.COM.

Principals only. EEO/AA





# Computerworld's Washington D.C. area Corporate Technical Recruiting Conference!

Monday, September 16, 1996 Fairview Park Marriott, Falls Church, Virginia

On September 16, 1996, you have a special opportunity to update your recruiting skills and network with recruiters in your area at the first-ever Washington, D.C. area Corporate Technical Recruiting Conference, held at the Fairview Park Marriott, Falls Church, Virginia.



# A Full Schedule of Contemporary Topics

7:30am Continental Breakfast & Conference Registration

**Concurrent Sessions:** 

How to Pick the Right People
Dr. William Swan, President, Swan Consulting
Soft Skills and the "Invisible Assembly Line"
Tony Barrile, President, Barrile & Associates
How the Techno MBA Fits into the Business Solution
Joan B. Craig, Director, Placement & Career Sves., U. of Pittsburgh

Proactive Recruitment Techniques
Dave Drugman, President, Bay Cities Research, Inc.

12:15pm Luncheon Keynote: Industry Trends
Maryfran Johnson, Executive Editor, Computerworld

**Repeat of Concurrent Sessions** 

Town Hall Forum Gary Cluff, President, Cluff and Associates

6:00pm Program ends

# **Selected sessions include:**

**Proactive Recruitment Techniques** 

Dave Drugman, President, Bay Cities Research, Inc.

To remain competitive, today's technical recruiters need to be aware of the latest trends in sourcing and proactive recruiting. This in-depth session from a leading expert will explore this critical topic and will help you put your resources and expectations into proper perspective.



Industry Trends Luncheon/Keynote Address

Maryfran Johnson, Executive Editor, Computerworld

Sure, there are new skills entering the market every day, but what are the trends that drive these skills? Maryfran Johnson, one of the industry's leading watchers of the Information Systems profession will give you an up-to-the-minute view in this very special keynote address.



**Town Hall Forum** 

Gary Cluff, President, Cluff and Associates

In this session, you'll not only be able to propose your specific questions for open discussion, you'll learn of real world issues and solutions from your peers. You won't want to miss this rare opportunity as Gary Cluff, an expert in the HR field, leads us through this modern discussion of your recruiting topics.

For more information, call the conference hotline: 1-800-488-9204

# This Web site

e-mails
you with the
career opportunities
you want.



Register today and USE CAREERMAIL

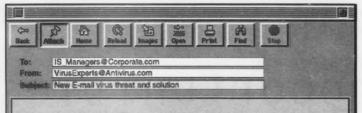
http://careers.computerworld.com

itCareers.

Where the careers find you.

# **Got e-mail? Got the Word Macro Virus?**

# You need E-mail VirusWall!



InterScan E-Mail VirusWall, virus protection for Windows NT by Trend

E-mail attachments are the primary carriers of the Word macro virus - the fastest spreading virus in computer history. To catch this new virus you're going to need the latest technology. Desktop scanners won't work. You need technology that scans fast so it doesn't slow down your mail system - technology that's flexible enough to fit into your complicated network without configuration - technology that stops viruses cold BEFORE they enter your intranet.

E-mail VirusWall for NT servers, scans Internet e-mail traffic right out of the box. Load it on to your E-mail server, or on to an NT machine that works as an SMTP relay host. E-mail VirusWall scans encoded attachments for viruses. When a virus is found, the infected attachment is stripped off, a warning is inserted into the original e-mail and sent to the recipient, and an alerting e-mail is sent to administrator and the original sender of the file. All of this is done automatically!

Trend's integrated virus scanner catches 100% of in-the-wild viruses (including the Word macro virus). It can decode and decompress mail attachments, and scan them in 0.12 seconds per file. It uses multi-threaded programming for best NT performance. The automatic virus pattern update service from Trend keeps your anti-virus up-to-date without administration hassle, and the experts at www.antivirus.com keep you informed of the latest virus out breaks and their solutions.

No wonder industry leaders such as Lotus, Novell, SCO, Intel, Control Data Systems and NetManage all utilize Trend's anti-virus technology.

Download your free evaluation copy of E-mail VirusWall for NT today from http://www.antivirus.com. (There is a special VAR program for Microsoft authorized Solutions Providers at www.antivirus.com/var.html).



"VirusWall is a key part of the security measures PNC Bank of Pittsburgh has implemented in conjunction with its online banking services.... 'In overall testing, VirusWall appeared to be the most robust' said Mike Goddard, assistant vice president for information security at PNC."

PC Week Labs July 18, 1996



"Better virus detection methods for email attachments will help considerably in reducing the macro virus problem. Trend Micro has a reputation for innovation and we applaud this excellent work."

Larry Jones,
Director of product marketing
for Lotus cc:Mail



# <u>Download</u> your evaluation copy from www.antivirus.com

For more product information send e-mail to: interscaninfo@mailback.com

1-800-289-0976

Come See Us at Windows NT Solutions Moscone Center, San Francisco Aug 27-29 Booth #1009



# Marketplace

# Four questions to ask before choosing a Web browser

With the outcome of the browser wars still uncertain, how do you decide whether to go with Netscape Communications Corp.'s Navigator, Microsoft Corp.'s Internet Explorer or some other browser? Computerworld asked four Internet analysts for advice on the subject. Here's what they say an information systems manager should ask before choosing a corporate World Wide

## What range of functions can a browser perform?

Most browsers offer basic features such as support for backgrounds and tables, the ability to view a Web page's Hypertext Markup Language source code and a way to create hot lists of favorite places. But not all of them do, so check a prospective browser to make sure it isn't missing

On a broader scale, take an inventory of all the activities your company's browser will be expected to support - electronic mail, Internet browsing, online sales or intranet access to a corporate database. "Tie the browser to the applications you'll need it for," advises Brad Meinert, director for Internet programs at Input, Inc., a market research firm in Mountain View, Calif.

Sometimes a company has just a few things it needs to do, and it needs a browser that does them very well," observes Rick Spence, technology analyst at KRON television in San Francisco and a former analyst at Dataquest.

For instance, if your main goal is to provide intranet access to an Oracle database, then Oracle Corp.'s PowerBrowser is a logical choice because it was designed with that in

# How easy is it to get employees to switch to another browser?

If your employees already use a browser, you'll have to decide if it's worth the effort to force a change "Many a CIO has discovered that their company has defaulted to Netscape by virtue of the fact that the employees have already downloaded it to their desktops," observes John Robb, Internet analyst at Forrester Research, Inc. in Cambridge, Mass. He says it's typically difficult to change browsers in midstream. "People personalize their browsers - they accumulate things like hot lists and plug-ins. So a CIO attempting to switch browsers will encounter a good deal of consternation within the ranks," Robb says.

Also, find out if your marketing department already has a corporate Web page up and running on the Internet. If so, not only has it chosen a browser, but it has also defined many of the features any other corporatewide browser will need to have - such as the ability to handle frames or video files

## What platforms does your browser need to support?

Although browser vendors are constantly working to provide support for multiple platforms, from DOS to Unix, you still need to check that your browser of choice can run on all the platforms you use. Microsoft, for example, has versions of Explorer for Macintosh and for Windows 3.1, Windows 95 and Windows NT, but it doesn't vet offer a Unix version.



### What do I need to know about vendor support?

ose a vendor that has good customer support and that looks like it's going to be around five years from now." Meinert advises.

Support is also a reason to avoid shareware or a beta-test browser. "It's always better to go with commercial products because there's somebody you can point a finger at if something goes wrong," Robb says.

"IS managers should be familiar with their browser's beta version, but they shouldn't be releasing it to the employees, or they're going to be spending a lot of time on support," says Tim Sloane, director of messaging at Aberdeen Group, Inc., a consultancy in Boston.

Hildreth is a freelance writer in Hyde Park, Mass.

# COMPUTERWORLD

A FREE SERVICE for our

(a) Call the Computerworld Marketplace (2) Ask for the extension listed in the

(800) 447-0018

# lendor Center

Software	Comput
3780 RJE Emulation ext. 517 Client/Server Development Tools ext. 509 Groupware ext. 511 Network Management ext. 512 Security ext. 516	Back-up/ Cabinets/ Desktop Furniture Kiosks . Mainfran Midrang/ Presenta Projector Security

omputers/Peripherals	Networking/Communications
Back-up/Tape/Disk ext. 216	Client/Server Tools , ext. 60;
Cabinets/Racks/	Diagnostic/Testing
Desktop PCs ext. 201	Equipment ext. 629
furniture ext. 220	Groupware ext. 600
Gosks ext. 217	Internet Products/
Mainframes ext. 215	Services ext. 634
Midrange ext. 219	Network Hardware ext. 619
Presentation/	Network Management ext. 60
Projectors/Panels ext. 205	Network Software ext. 618
Security ext. 218	Remote Access ext. 63
Servers ext. 214	Security ext. 63
Storage/RAID/	Storage/Cabinets/
OAT/Optical ext. 209	LAN Racks ext. 220
Workstations ext. 203	Windows NT ext. 61

Services
Consulting/Contract
Programming ext. 703
Conversions ext. 707
Data Recovery , ext. 708
Outsourcing/Remote
Computing ext. 706
Training/
Software Support ext. 704

Application Developm		t	T	0	0	l	;			ext.	330
Browsers										ext.	305
Consulting			×				*			ext.	308
Encryption	1									ext.	312
Firewalls					10					ext.	314
Security .										ext.	322

Get detailed product information direct from a variety of manufacturers.

Where IS Buyers Find Solutions

TO ADVERTISE. Call toll free: 1-800-343-6474 Ext. 7744

premier solutions

# Go Direct For Great Presentations



GO DIRECTLY TO THE SOURCE FOR THE LOWEST PRICES AND THE REST SERVICE



PROCOLOR 3080+

\$ 6400 Eustaest Laasa 

**IBOXLIGHT** CORPORATION

Presenting A Better Way."



Government: (800) 497-4009 Resellers: (800) 736-6956 International: (360) 779-7901 Rental: (800) 736-6954

Fax: (360) 779-3299 Education: (800) 689-6676

http://www.boxlight.com



BEACON 2500

Business Lease \$199/Month

REVOLUTION \$6499 Business Lease\*

280 lumens 2 13.8 lbs.

PROCOLOR 2001

\$4999 Business Lease 250 lumens 2 16 lbs.

640 x 480 (800 x 600 compressed)



PROCOLOR 1820

\$ 2400 Business Lease

LCD 10.4" diagonal 5.5 lbs. 640 x 480

ORDER, CALL

Prices subject to change. Quantities may be limited to stock on hand

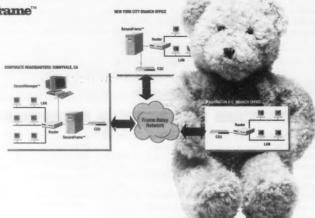
# IS YOUR FRAME RELAY NETWORK INSECURE?

# Secure it with SecureFrame

You can save a bundle by moving to frame relay. But your network becomes less secure as you transmit sensitive data over a shared environment.

SecureFrame from Cylink Corporation is the only security product offering internationallyrecognized information security standards for Privacy, Integrity and Authentication. SecureFrame's superior network management combines ready compatibility with long-term scalability across any public or private frame relay network. Security policy management enables a virtual private network (VPN) utilizing flexible.

fully-automated key management. The unit is easy to maintain and operates transparently, having no noticeable impact on users, applications, or network performance.



# Delivering network security since 1984

Cylink has been the leader in WAN security since 1984, providing a complete line of network security products which combine hardware and software into a single package. Twelve years and thousands of installed security devices later, Cylink's reputation for reliability, service, and support remains unsurpassed among Fortune 500 companies, financial institutions, and government agencies.

Don't wait. . . move to frame relay and save. Call Cylink today or visit our web site.

# THICYLINK

Cylink offers sales and service through a worldwide network of direct sales and business partners.

910 Hermosa Court, Sunnyvale, California 94086 Tel: 408-735-5800 Fax: 408-720-8294
Fax on Demand: (USA)800-735-6614 (#257) [Int'l.]408-735-6614 (#257) E-mail: info@cylink.com http://www.cylink.com/

Where IS Buyers Find Solutions TO ADVERTISE, Call toll free: 1-800-343-6474 Ext. 7744

software • hardware • buy/sell/lease • services

Your best choice for mainframe computing services.

COMPUTING

**Extensive Software Library** 

Advantis Compuserve Tymnet Internet and WWW Services

Year 2000 Conversion/Testing Platform
Extraordinary Customer Service
Complete Migration Management

MVS/ESA IMS/DBDC VM/ESA CICS SAS VSE/ESA TSO DB2

GIS Information Systems Inc.,

708-574-3636 815 Commerce Drive, Oak Brook, IL 60521

a subsidiary of May & Speh

# ALICOMP/OCBS

A Unique Outsourcing Services Provider

# **OUTSOURCING • REMOTE COMPUTING**

TRANSITIONAL AND LONG TERM CUSTOM SOLUTIONS VM • MVS • VSE 105,000 sq.ft. Secaucus, NJ Complex

"OUR PLATFORM IS CUSTOMER SATISFACTION"

SERVING CLIENTS SINCE 1980

800 274-5556

201 319-8787

# WARNING

Without a ROSS hyperSPARC Upgrade, your workstation is too slow.

- Full multiprocessing capability, up to four processors
- Fastest SPARC microprocessors in the industry
- For SPARCstation 10 and 20, and SPARCserver
   GOO services machines
- Range of processor/second level cache options available
- Fully SunSoft supported
- · Take less than 30 minutes to install

1-800-621-4668

R SS

Marco International Inc.

C 1998 PDSS Technology Aff rights reserved. All SPARC trademarks one Sunfolf are insdemarks or registered trademarks of Sun Microsystems, Inc.

Kablit™ Security =

# NOW!

# STOP COMPUTER THEFT

- Secure computer or notebook to desk, table, etc.
- Protect data
- Lifetime warranty

Rāblit™ II Kablit™ T-Lock

Disk Drive Lock

Deto Security List \$24.95

ed Location

List \$34.95

List \$39.95

Padlock Securit Provided by Master' Lock

Quick And Easy To Install! Compact — Lightweight! Available For Macintosh Computers Too!



Order Now - Call 800 - 451-7592



18 Maple Court, East Longmendow, MA 01028, USA 413-525-7039

The particular Master® Lock Trademarks used are trademarks of the Master® Lock Company and are used by Secure-It, Inc. under license

# DATA INTERCHANGE and BACKUP SOLUTIONS SPECIALISTS

PC
HP
SGI
The Tape Experts
The Tape Experts



The World's Best Tape Drives from the Tape Experts



DEC SUN AT&T SPARC

SPARC

3480

AS400

RS6000

NETWARE





VALUE



DURLSTAR.

1-800-468-0680

FAX: (818) 592-0116 TEL: (818) 592-0061

COMPUTERWORLD MARKETPLACE

gets your message in front of the right buyers

- 54% have made a purchase within the last 3 months.
- 52% look at the Marketplace section for the advertisements.

  It's where they shop!

  Source: Computerworld Marketplace Study, IDG Research Services Group, Oct. \*195

Call today to get your message across! (800) 343-6474, ext. 7744

Marketplace

# ENTERPRISE CONNECTIVITY

direct channel-attached multiprotocol converter/controller.

Mainframe LAN
Local & Remote
ASCII Access
Dial-Up Gateway

- Block or Byte Channel Attached.
- OUp to 256 Async Ports/16 LANs.
- SNA and Non-SNA Gateway PU.
- Modular Design for Easy Expansion.

1-800-554-9372 http://www.jdsm.com

# COMPUTERWORLD TO THE STATE OF T

Where IS Buyers Find Solutions TO ADVERTISE, Call toll free: 1-800-343-6474 Ext. 7744

# classified solutions

#### SOFTW.

# PC DIAGNOSTICS OmniPost Analyzer The only 3 in 1 tool:

- 1. IRQ and DMA conflict detection
- 2. Self-booting Diagnostics
- 3. Enhanced Power-On-Self-Test
- ♦ Works on Win95, Novell, DOS, Unix, OS/2
- ◆ Test XT, AT, ISA, EISA, VESA, PCI, PS/2 25 and 30
- ♦ 8- and 16-bit Hardware analyzer.

Call for FREE Diagnostic Software

TriniTech, Inc. 1-800-909-3424

# Beyond 1999 for Century Date Change

- ♦ Host or PC Version
- ◆ COBOL, PL/1, RPG, CICS IMS DB/DC, DB2, VSAM
- ♦ Full-Featured, Automated
- ♦ 45 Online Screens & 85 Reports
- ◆ Purchase or Lease Option
- ◆ Flat Fee, Fixed Rate Service
- ◆ Professional Affiliations
- ◆ US & offshore Data Centers CCD Online Systems, Inc. 1-800-328-6755 www.CCDonline.com

+ HARDW

# We BUY! We SELL! We REPAIR!

STRATUS WYSE TELEVIDEO DEC IBM FALCO

# 800-410-6161



VISA

Computer Hardware Resources, Inc.

www.chrhq.co

# SALES UP!

- Ad sizes available from 1/20th page to a full page
- Black & white or color ads, use graphics and your logo
   LOW RATES

Call today to place your ad 800-343-6474, ext. 7744 COMPUTERWORLD

# Marketplace

EXPENSES DOWN!

bttp://ww Advertiser's Index .....(800) 274-5556 CCD Online Systems, Inc. .http://www.chrhq.com ...... (a subsidiary of May & Speh) ......http://owls.com/secuire-it/index.html .......107 Trinitech (800) 909-3424

This index is provided as an additional service. The publisher does not assume any liability for errors or on

# SURF'S UP AGAIN

With Computerworld's Fall Edition of the Internet Resource Directory

# Your desktop reference for Internet products and services

- · New and updated offerings from a variety of vendors
- Organized by major product/service categories that include Web servers, ISDN adapters, Web development tools, encryption software, security services, access providers, Web designers and more.
- · Advance distribution of the directory at: Internet Commerce Expo (ICE), September 9-12/Anaheim, CA
- Plus distribution of the directory in Computerworld's September 16 issue at: Networld + Interop, September 18-20/Atlanta

# COMPUTERWORLD

Everything you need to know.

Don't miss it! Catch the wave this September with Computerworld's Internet Resource Directory



Bound into the September 16 issue of Computerworld

## Computerworld, Inc.

CEO/ President Gary J. Beach Executive Vice President Steven F. Woit

Senior Vice President/ Finance Matthew C. Smith

Vice President/ Human Resources Susan C. Perry

Executive Assistant to the CEO/President Karen E. Elliott

## Computerworld

An IDG Company: The World's Leader in Information Services on Information Technology

Publisher

Computer world Headquarters: 500 Old Connecticut Path, P.O. Box 9171, Framingham, MA 01701-9171 Phone: 508-879-0700, FAX: 508-875-4394

Paul Gillin

Vice-President Sales/ Associate Publisher David Peterson

Vice-President Marketing Bob Winter

Consumer Mana. Gail Odeneal

PUBLISHEN'S OFFICE Assistant to the Publisher/Lois Beninati MARKETING: Director, Marketing Communications/Mary Doyle Senior Manager, Marketing Communications/Elizabeth Phillips, Manager, Trade Show & Conventions/Audrey Abbott, Marketing Manager/Sama Thaster, Admerting Communications Project Manager/Karen Lesko, Marketing Specialist/Emily Dinneen, Administrative Assistant/Paity White EMCAUATION: Director of Circulation Managemen/Mana

# Sales Offices

Associate Publisher/Nice-President/Sales
David Peterson
Computerworld Headquarters: 500 Old Connecticut Path, P.O. Box 9171 Framingham, MA 01701-9171
Phone: 508-879-070, PAX: 508-879-0446

Regional Vice President: Sherry Driscoll, Senior District Managers: Bill Cadigan, John Watts, District Manager: Isabelle Kane, Sales Office Coordinator: Tammy Boisvert, Sales Assistants: Cheryl Stratton, Barbara Shuman, 470 Totten Plond Bd., 5th Floor, Totten Plond Bd., 5th Floor, Waltham, MA 02134 (508) 879-9700 FAX: (617) 989-369 Hearing Impaire (800) 428-824



Senior District Managers Fred LoSapio, Vicki Gonin, Mike Bachman, District Manager Barry Cheney, Sales Assistants: Susan Kusnic, Jean Dellarobba, John Radzniak, Mack Center 1, 365 West Passaic S., Rochelle Park, NJ 67662 (201) 587-0090 FAX: (201) 712-9786 Hearling Impaired; (80) 206-2088

South Allontic

Regional Vice President: Bernie Hockswender, Sales Assistant: Regional Vice Presidents Bernie Hockswender, Sales Assistant: Jennifer Pattenaude, 1568 Woodington Circle, Suite 201, Lawrenceville, GA 30244 (770) 931-8104 FAX: (770) 931-8106 Hearing Impaired: (800) 449-4974, Senitor District Manager: Mike Bachman, Sales Assistant: Mary Zevaliere, 175 Strafford Ave. #1, Wayne, PA 19087, (610) 975-4581 FAX: (610) 975-4582

Midwest
Senior District Manager: Sharon R. O'Brien, Sales Assistant: Denice
Richards, 980 N. Michigan Avenue, Suite 1400, Chicago, II. 60611
(312) 214-3006 FAX: (312) 214-4962

Coston Eventor Proc. Osta 2 servesto.

Coston Bibliotinins

Bouton: Vice President/Larry Craven, Director of Publishing Servives/Carolyn Meriotin, Orject Conditator/Heidl Broadley,
Managing Editor/Peter Bochner, Graphic Designer/Gail Varney, 50

Old Connecticut Path, Bon 9171, Frantingham, MA 0710-9171 (200)

873-9700 FAX: G808 875-8310

San Franciscon Vent Costo Director/Elaine R. Offenbach, Sales
Associate/Vidid Wilson, 500 Airport Bouleward, Sainé 400, Burlingame,
CA 69401 (15) 247-6505 FAX: (13) 247-6321

Computervorlé Journals

Associate Publisher: James Hussey, 500 Old Connecticut Path, Box. 9171, Framingham, MA 07019471 (508) 879-0700 PAX: (508) 872-2364

East: Don Calamar, 1858 Window Park Lane, Havertown, PA. 1983 (610) 446-5732 PAX: 6100 446-5735

West: Sharon Chin, 500 Airport Boulevard, Suite 400, Burlingame, CA 94010 (415) 347-0555 FAX: (415) 347-8312

Marketplace Advertising

Sales Manager/Michelle Revers, Sales Assistant/Christine Tenueson Northeast Account Executive/Laurie Gomes, Central/Southeast Account Executive/Laurie Gomes, Central/Southeast Account Executive/Laurie Gomes, Central/Southeast Table 1997, 19

Computerworld VAR Database: Carol Mullen/ National Sales Manager, Account Executive/Sean Weglage, (508) 879-0700 FAX: (508) 879-0184

Computerworld Buyers Database East: Regional Manager, Database Services/Linda Clinton, (508) 879-0700 FAX: (508) 879-0184 Computerworld Lead Management: Eastern Regional Manager/ Phil Lambert, (508) 879-0700 FAX (508) 628-0547, Western Regional Manager/Gena Haas, (415) 347-0555 FAX (415) 347-8312

Senior District Manager:
Darren Ford, Sales Assistant:
Brenda Shipman, 14651 Dallas
Parkway, Suite 304, Dallas, TX
75240 (214) 233-0882 FAX: (214) 7019008 Hearing Impaired: (800) 8224918

Vec-President Western Advertising Sales Kernar Enginea, Senior Basiri, Mana-gers Ernie Chamberlain, Kaye Shar-brough, Linda Holbrook Dussay, in Christine Curry, District Managers: Lina Kowalski, Denyce Kehoe, HR Representative: Letcia, Lehane, Opera-tions Manager: Desites Hui, Sales Associate, CS; Shannon Dempos-Back- Associates, Tamara Haney, Andrea Zurele, Ermite Hung, Amy Blechman, Todd Herrold, Olive Services, Jessica Abade, Sales Bondeward, Suite, Oliv. Burtingame, CA 49010 (413) 347-4555 FAXC (415) 347-8512 Hearing Impaired: (800) 9003179

District Manager: Nancy Coy-Bianchi, Sales Associate: Pat Duhl, 2171 Campus Drive, Suite 100, Irvine, CA 92612 (714) 250-3942 FAX: (714) 476-8724

Advertising Operations
Display Advertising Production Manager: Paula Wrigh
Display Advertising Coordinators: Lisa Tanner, Gregg
Pinsky, (508)-879-0700 FAX: (508) 879-0446

Recruitment Advertising Sales Offices Vice President/Recruitment Advertising/John Corrigan, Marketir Director/Derek E. Hulitzky, 500 Old Connecticut Path, Framingh MA 01701-9171 (800) 343-6474

New England: Regional Manager/Nancy Percival, 470 Totten Pond Rd., 5th Floor, Waltham, MA 02154 (800) 343-6474, Account Executive/Nancy Mack, (800) 343-6474

Executive/Vamy Mack, (800) 43-6474

Mid-Atlantice Regional Manager/Marty Finn, Mack Center 1, 365

West Passic St, Rochelle Park, NJ 07062 (201) 387-0900, Account

Executive/Carp 1001, 6000 34-6447 TDD: 6000 360-6208

South-Atlantic: Regional Manager/Katie Kress, 8304 Professional Hill

Drive, Paritac, VA 22031 (700) 573-4115, Sales Manager/Pauline Smith

(800) 345-6474

(800) 34-50-14 Michwest: Regional Manager/Pat Powers, 1011 East Touhy Avenue, Suite 559, Des Plaines, IL 60018 (847) 827-4433, Sr. Account Executive/Ellen Cross (800) 343-6474 TDD: (800) 227-9437 West: Regional Manager/Barbara Murphy, 2171 Campus Drive, Ste. 100, Irvine, CA 92715 (714) 250-0164, Sr. Account Executive/ Christopher Glenn (800) 343-6474 TDD: (800) 203-5867 Internet Cazeern Site: Jay Savell, Account Executive, 500 Old Connecticut Path, Framingham, MA 01701-9171 (800) 343-6474

Direct Response Cards

National Accounts Director/Norma Tamburrino, Sales Associate/ Christine McGovern, Mack Center 1, 365 West Passaic St., Rochelle Park, NJ 07662 (201) 587-0090

Director/Elizabeth Cooper, Sales Associate/Nancy Dillon, 500 Ai Boulevard, Suite 400, Burlingame, CA 94010 (415) 347-6555 FAX: 347-8312

#### International Data Group

man of the Board, Patrick J. McGovern; President, Kelly Conlin; Chief Operating Officer, Jim Casella

Computerworld is a publication of International Data Group, the world's largest publisher of computer-related information are leading global provider of information services on information textnology. International Data Group publishes over 200 compublications in SC countries. Forty million people read one or more International Data Group publications each month.

# Advertisers Index

	Acer America	70-72	1
	Adobehttp://www.adobe.com	29	
	Aim Technology		1
	Advanced Logic Research http://www.alr.com	79	
	Amdahl	. 38-39	
	BMC	110	
	Cabletron	80	
	Client Server Connection http://www.cscl.com	. 52-53	
	Compaq Computer Corp 34-35 http://www.compaq.com	6, 66-67	
	Computer Associateshttp://www.cai.com	. 22-23	
8	Compuware		
	Dell41	1-43, 45	
	EMC Corphttp://www.emc.com	68	
	Epson Americahttp://www.epson.com	56	
	Fujitsu	64	
	Hewlett-Packard		
	IBMhttp://www.ibm.com	. 89, C3	
	Informix Software	25	
	Internet Commerce Expo	48	
	Intranet Series	. 32/33	
		114	
	Lawson Software	76-77	
		11	

Meta Group	. 24
Micro Focus	7
Micron	116
NEC Technologies	. C4
Oracle Corp	5,9
Peoplesoft	. 17
http://www.peoplesoft.com	
(800)947-7753	
Powersoft	. 13
Red Brick	. 15
SAS Institute	1, 55
Spearhead Systems	. 51
http://www.spearhead.com	
	6-47
Sun Microsystemshttp://www.sun.com	. 62
Sybase	0-31
Syncsort	3
Tivoli Systems	0-61
http://www.unisys.com	2-83
	10
http://www.usconnect.com	
Virtual Integration	
Workstation Group	59

To have your Internet address listed here, please contact Paula Wright at (508) 620-7716

## Have a Problem With Your Computerworld Subscription?

We want to solve it to your complete satisfaction, and we want to do it fast.

COMPUTERWORLD, P.O. Box 2043, Marion, Ohio 43305-2043.

Your magazine subscription label is a valuable source of information for you and us. You can help us by attaching your magazine label here, or copy your name, address, and coded line as it appears on your label. Send this along with your correspondence.

Address Changes or Other Changes to Your Subscription
All address changes, title changes, etc. should be accompanied by your address label, if possible, or by a copy of the information which appears on the label, including the coded line.

Your New Address Goes Here	Address shown: Address Business	
Name		_
Company		_
Address		
City Sta	e Zip	
Other Questions and Problems		

It is better to write us concerning your problem and include the magazine label. Also, address chang are handled more efficiently by mail. However, should you need to reach us quickly the following toll-free number is available: 1-800-669-1002 Outside U.S. call (614) 382-3322). CompuServe members can reach us at account number 73373, 1230. Internet address: circulation@cw.com

COMPUTERWORLD allows advertisers and other companies to use its mailing list for selected offer would be of interest to you. We screen these offers carefully, If you do not want to remain on the preplease write to the following address – COMPUTERWORLD, Circulation Department, 500 old Conne



# PATROL puts out your fires before you feel the heat

# There's only one way to gain control of your environment — PATROL

Performance and availability issues are flaring out of control. Worse, your users are informing you of the problems. To change the scenario, you've got to proactively monitor and manage applications, the databases they run on and the underlying resources. You also have to make the most of the system and network management frameworks you have in place. There's only one solution -PATROL from BMC Software.

Only PATROL puts it all together. And with 16 years of experience, more than 100 products and numerous technology partnerships. BMC Software - the world's largest database and application management tool vendor - is the company you can rely on to deliver it TODAY.

Keep your cool. Discover and correct problems before

# Unrivaled database management -

- CA-Ingres
- CA-OpenIngres • DB2 for AIX
- · DB2 for MVS†
- DB2 for OS/2
- Informix
- · Microsoft SQL Server
- · ObjectStore
- Oracle
- · Rdb
- Sybase
- · With more in development.

# Unparalleled application management -

- Lotus Notes
- · Oracle Financials
- · PeopleSoft HR†
- SAP R/3†
- TUXEDO System
- · With many more in development.
- Manager
- Tivoli TME

# Unmatched integration today -

- CA-Unicenter
- Cabletron **SPECTRUM†**
- · HP OpenView
- IBM NetView for AIX
- POLYCENTER Manager on NetView
- · Remedy ARS
- Solstice SunNet

# Unequaled hardware & operating system support -

Only PATROL runs on more than 20 hardware platforms and operating systems, including:

- · MVS†
  - OpenVMS · OS/2

  - Unix
  - Windows NT
  - Windows 95†
  - · With more in development.

they impact your organizational productivity. Only PATROL can help you monitor and manage the big picture. For a white paper or for a free trial, call 1 800 811-6766 or 713 918-8800 (ext. 1371). Or visit our home page at http://www.bmc.com/pat

ngapore, Spain and the United Kingdom. Distributor and ent offices in 25 countries. BMC Software and the BMC ware logo are registered trademarks of BMC Software, Inc. USA registration. All other products mentioned are either trade

Finance & Investing

# Someone to watch over me

In the perilous early stages of a high-tech start-up, it helps to have an angel in your pocket

> hile some companies rocket toward lucrative initial public offerings with the backing of well-heeled venture capitalists, the vast majority of start-ups must struggle along with minimal resources.

However, a few lucky ones find an "angel," a private investor who can provide the funds they need to move their businesses into the fast lane. Such angels pony up between \$10,000 and a few hundred thousand dollars in early-stage money, along with lots of advice and hand-holding.

Angels, many of whom became wealthy by starting their own high-tech companies, can also lend credibility to start-ups, says Ralph Wagner, an angel in Wellesley, Mass. Indeed, it is in their role as active investors, taking positions on boards of directors or offering informal consulting, that angels provide some of their greatest value. And it is a two-way street. Angels say they are usually drawn to investments by the chance to share their insights and help give direction to a new enterprise — and by how appealing the company's goals are.

Wagner, who made his money as a software entrepreneur, usually invests in software firms. His background includes sales jobs for IBM in the 1950s and '60s and consulting work for Arthur D. Little, Inc. He also founded one of the first direct sales companies that offered IBM microcomputers to corporate customers.

In 1985, after selling his successful chain of computer stores, he began to invest in early-stage software and hardware companies, using his knowledge of the industry to offer experienced insights to his fledgling companies.

"I'm looking for people who are leaving well-paying jobs to pursue an idea," he explains. He is attracted to investments that "look like fun," and yet he wants to get in early enough to "get meaningful value — otherwise I'd be better off investing in Coca Cola."

Angels not only need to be good entrepreneurs, but they also need nerves of steel, according to J. A. Piscopo in Oak Brook, Ill. In 1969, Piscopo founded Pansophic Systems, one of the industry's pioneer software firms. It was acquired by Computer Associates International, Inc. in 1992.

"You must be willing to deal with companies that are always firting with bankruptcy," says Piscopo, who has invested in a variety of companies over the past 10 years. "That seems very ordinary to me because I've been there myself, but to someone accustomed to the stock market, it would be a cause for panic."



Pansophic Systems' J. A. Piscopo: You must be willing to deal with companies that are always flirting with bankruptcy'

Similarly, picking investments is an art rather than a science, Piscopo says. "There are none of the conventional kinds of valuations you might use on a Fortune 500 company."

The uniqueness of the product and the quality of the team are part of what Piscopo considers. He also looks for a solid business plan. And before he forks over any cash, he says he checks to see whether that plan provides for enough capital to survive if things go "a little bit wrong."

#### Bigwins

But most of the time his investments have gone more than a little bit right. "With my own company, as founder, I earned 850 times my original investment. And even with the other companies I have invested in, I usually aim for 10 to 15 times my investment," Piscopo explains. On a few occasions, though, he admitts, "I've lost everything."

Finding potential deals is no problem for these angels. The deals find him, Piscopo says. Most come through business associates or former employees, and most turn out to be of little interest, he says.

But how do less well-connected entrepreneurs find an angel? Thanks to several matchmaking organizations, the careful courtship of capital and companies goes on with or without the old-boy network. Betty Kadis is interim director of the Technology Capital Network — the oldest such group — that operates under the auspices of the MIT Enterprise Forum in Cam-

bridge, Mass.

Kadis says a shift by venture capital firms toward bigger deals has left a gap that angels are eager to fill. However, unlike venture firms, most angels are comfortable waiting five to 10 years for payback, she says.

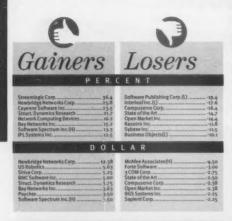
Angels may be taking on more importance in helping start-ups now that established venture capital firms have set their sights on larger deals, suggested a recent article in *Venture Capital Journal* in New York.

And while figures on the scale of angel investing are far from reliable — because angels are so adept at avoiling the limelight — as many as 250,000 individual angels may be responsible for up to \$10 billion to \$20 billion in investments annually. That is several times the value of investments by traditional venture capital firms.

Patience may be the final requirement for successful angel investing. Angel Bob McCray recalls that one investor in his firm had to wait 20 years to get a payback. However, the payback was \$1.2 million on an initial investment of \$5,000. McCray says he tries to remember that as he works with small companies, but he still prods them a bit. Companies that manage to become profitable in a shorter time - say one or two years - are allowed to pay him back at a much lower rate of return. "I like to structure things so the entrepreneur will still have a chance of making lots of money for himself," McCray says.

Earls is a freelance writer in Franklin, Mass.

# The Week in Stocks



# Gateway 2000 branches out

Industry Almanac

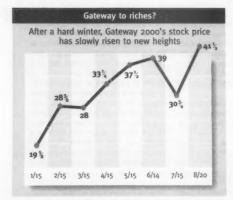
Recent quarterly sales of PCs show a 12% increase over the same quarter a year ago, according to a report from Dataquest in San Jose, Calif. And Gateway 2000, Inc. (Nasdaq:GATE) is one of the leaders of the pack.

Gateway's PC shipments rose 48% over the same quarter last year. Since January, Gateway has tried to change its image from a single-market, single-product company to a worldwide marketer of varied PC devices. Analysts have approved.

Although Gateway's direct-sales approach has served it well in the past, the North Sioux City, S.D., firm is branching out. In the past year, it has expanded into markets in Europe and Asia. It introduced the Solo 2100 line of notebook PCs and rolled out Gateway Destination, a large high-priced PC/television.

This surge into new markets pleased analysts. "We're very bullish on Gateway, and we think the Destination product shows true innovation," says Megan Robertson, a market analyst at Smith Barney Shearson, Inc. in New York. Robertson says Gateway's direct-marketing model lets the company control inventory more precisely and offer better pricing. She expects the stock to rise to \$50 in the next 12 months.

Gateway's ventures into foreign markets will be very beneficial, says Wendy Abramowitz, an analyst at Argus Research Corp. in New York. "They have such good administrative systems that as they continue to expand internationally, their already-strong revenues will grow even more." Abramowitz says she expects Gateway's stock to rise to about \$50 within the next year. - Stewart Deck



Ехсн	52-WEE	K RANGE		Aug. 23 Noon	WK NET WK PCT CHANGE CHANGE
Com	munical	Designated	Remork-Yeonous	15.5	UP 2.37%
COMS	53.63 66.88	33.50 48.25	3 COM CORP. AMERITECH CORP.	43.38 54.00	-2.75 -6.0 -0.38 -0.7
ASND	68.88 71.25	49.25 15.25	AT & T ASCEND COMMUNICATIONS	54.38 50.38	·1.38 ·2.5 2.63 5.5
BAY	71.25 13.63 50.00	5.13 20.25	BAYAN SYSTEMS INC. BAY NETWORKS INC.	5.69 27.50	-0.19 -3.2 3.63 15.2
EL LS	80.38	43.50 32.75	BELL ATLANTIC CORP. BELLSOUTH CORP.	58.63 38.25	-0.38 -0.6
RKT	45.88 32.75	6.88	BROOKTROUT TECHNOLOGY CABLETRON SYSTEMS	21.63	-0.88 -3.9
SCC	87.75 74.75	50.13	CASCADE COMMUNICATIONS	63.38 67.63 12.88	0.13 0.2 0.38 0.6
GRM	25.13	12.25	CENTIGRAM COMMUNICATIONS CISCO SYSTEMS INC. COMPRESSION LABS INC.	12.88 57.06	-0.75 -5.5
MNT	59.38 9.25 10.50	4.50	COMPRESSION LABS INC. COMPUTER NETWORK TECH.	6.88 5.75	-0.06 -0.1 0.38 5.8 0.25 4.5
COM	14.50	8.00	CROSSCOMM DSC COMMUNICATIONS	9.50	0.00 0.0
ORE	64.00 44.75	21.88 15.38	FORE Systems Inc.	30.75 34.50	2.00 6.2
DC SX	21.88 41.50	9.13	GENERAL DATACOMM INDS. GENERAL SIGNAL NETWORKS (H)	11.13	-0.38 -3.3 1.25 3.2
TE	49.25 39.25	35.63	GTE CORP.	41.00	-0.25 -0.6
CIC	31.13 34.50	22.38 5.50	LUCENT TECH. MCI COMMMUNICATIONS CORP. MICROCOM INC.	37.25 25.50 8.44	-0.50 -1.3 -1.56 -5.8 -0.44 -4.9
ETM	34.00	7.63	NETMANAGE INC. NETRIX CORP.	8.88	-0.63 -6.6
CDI	10.25	2.88	NETWORK COMPUTING DEVICES	7.25 5.38	0.75 16.2
WK ETG	42.00 27.63	11.50 15.00	NETWORK EQUIPMENT TECH. NETWORK GENERAL	12.75 18.63	1.00 8.5
IN IT	74.25 55.88	25.00 31.50	NEWBRIDGE NETWORKS CORP. NORTHERN TELECOM LTD.	60.38 50.88	1.00 5.7 12.38 25.8 0.38 0.7
OVL	21.25	10.13	NOVELL INC.	11.13	-0.25 -2.2
OCTL.	59.25 29.00	43.75	NYNEX CORP. OCTEL COMMUNICATIONS CORP. (H)	29.00	1.63 5.9
DSI	43.25	16.50 25.88	OCTEL COMMUNICATIONS CORP. (H) OPTICAL DATA SYSTEMS INC. PACIFIC TELESIS	19.13 34.13	-1.13 -5.6 -0.13 -0.4
TON	44.72	20.75	PICTURETEL CORP. PROTEON INC.	35.38	-0.88 -2.4 -0.19 -6.4
COAS	7.63	3.75	RACOTEK INC.	3.75	-0.50 -11.8
BC	60.25	1.81	RETIX SBC COMMUNICATIONS	7.00 49.13	0.63 9.8 -0.38 -0.8
SFA SHVA	22.00 87.25	11.38 20.38	SCIENTIFIC ATLANTA INC. SHIVA CORP.	14.25	0.38 2.7 5.25 12.4
ON	45.50 23.50	29.25	SPRINT CORP.	39.63 12.88	-0.25 -0.6 0.00 0.0
BIT	13.88	2.38	STANDARD MICROSYSTEMS CORP. TELEBIT CORP.	13.06	0.06 0.5
ISW	48.38	32.25 28.38	US ROBOTICS US WEST INC.	30.50	5.63 11.5 -0.25 -0.8
CYLN	17.50 76.00	8.88	XIRCOM XYLAN CORP.	13.50	-0.38 -2.7 -0.63 -1.5
	_			8000	UP 0.66%
ALR	10.38	kstation 5.88	ADVANCED LOGIC RESEARCH	7.13	-0.38 -5.0
ASTA	46.25	16.00	APPLE COMPUTER INC. AST RESEARCH INC.	7.13 23.63 5.00	1.13 5.0 -0.13 -2.4
PQ	59.13	35.88	COMPAG COMPUTER CORP. (H)	57.50	-0.88 -1.5
ATE	63.75 43.81	23.00 18.00	DELL COMPUTER CORP. (H) GATEWAY 2000 INC. (H) HEWLETT PACKARD CO.	63.75 43.81	2.75 4.5 2.31 5.6
HWP	57.75 29.88	36.88 8.75	HEWLETT PACKARD CO. MICRON INTERNATIONAL INC.	43.13	1.00 2.4 -0.50 -3.3
IIPNY GI	75.13 44.88	49.88 20.00	NEC AMERICA SILICON GRAPHICS	55.00 23.63	0.25 0.5 0.38 1.6
SUNW	67.13	26.38	SUN MICROSYSTEMS INC.	55.13	0.00 0.0
	e System	ns	ALC: UNIVERSELY	300	OFF 0.58%
AMH DGN	13.50 19.13	6.75 8.88	AMDAHL CORP. DATA GENERAL CORP.	10.00	-0.63 -5.9 0.38 3.4
DEC	76.50	30.50 83.13	DIGITAL EQUIPMENT CORP.	38.38 113.13	0.38 1.0 2.13 1.9
MDCD	20.25	7.13	MERIDIAN DATA INC.	9.13	0.25 2.8
NETF	7.50 25.38 8.50	2.75	NETFRAME SEQUENT COMPUTER SYS.	12.63	-0.25 -8.0 0.88 7.4 -0.13 -5.6
SEQS SRA	36.13	1.88	SEQUENT COMPUTER SYS. SEQUOIA SYSTEMS INC. STRATUS COMPUTER INC.	18.63	-1.13 -5.7
TDM	15.25 9.13	8.38 5.38	TANDEM COMPUTERS INC. UNISYS CORP.	10.75	0.00 0.0
500	WASH	2000	The state of the state of	836E	Off 0.22%
ADBE	74.25	28.50	ADOBE SYSTEMS INC.	36.06	3.19 9.7
AMSW	A 8.75 42.50	3.63	AMERICAN SOFTWARE INC.	4.88	-0.38 -7.1 -1.50 -6.0
ARSW	82.75	28.75	APPLIX INC. ARBOR SOFTWARE	40.00	-1.00 -2.4
ADSK BGSS	50.00	18.50 29.75	AUTODESK INC. (L) BGS SYSTEMS INC. BMC SOFTWARE INC.	21.50	-2.25 -4.8
BMCS BOOL	74.00 26.75	32.50 19.25	BMC SOFTWARE INC.	74.00	5.00 7.2
BORL BOBJY	21.25	6.06	BOOLE AND BABBAGE BORLAND INT'L INC. BUSINESS OBJECTS (L)	8.25	-0.63 -7.0
CAYN	11.88	4.00	CAYENNE SOFTWARE INC.	5.25	1.00 23.5
COGN	27.88 F 27.38	14.13 9.75	CHEYENNE SOFTWARE INC. COGNOS INC.	19.25	0.00 0.0
CA	58.63 15.50	24.88	COMPUTER ASSOCIATES COMPUTERVISION CORP.	58.13 6.75	0.00 0.0
CPWR	46.00	15.50 10.75	COMPLIMADE CORP. (H)	45.00	0.13 0.3
COSFI	19.13	8.25	COMSHARE INC. COREL CORP.	9.06	0.31 3.6
FILE	13.75 67.00	3.25	DATAWARE TECHNOLOGIES INC. FILENET CORP.	24.50	0.00 0.0
FRTE	81.75 F 8.00	24.75 3.56	FORTE SOFTWARE	29.7	3.00 -9.2
FTPS GPTA	40.63	5.88	4TH DIMENSION FTP SOFTWARE INC. GUPTA	5.15 8.88	9 0.31 6.4 3 0.13 1.4 0 0.13 2.9
HUM	28.88	15.00	HUMMINGBIRD COMM. LTD.	18.50 12.25	0.13 2.9
HYSW	16.25	9.75	HYPERION SOFTWARE CORP. INFORMATION RESOURCES	12.31	8 0.00 0.0
1FMX INGR	36.75	16.88 9.13	INFORMIX CORP.	25.6 9.1	3 0.13 0.5 3 -0.31 -3.3
LEAF	12.63	3.38	INTERLEAF INC. (L) INTERSOLV INC. (L)	3.50 7.80	0 -0.75 -17.6
INTU	89.25	31.75 8.25	INTUIT INC. LOGIC WORKS	38.6	3 0.38 1.0
MAPS	24.00	7,50	MAPINFO CORP.	9.7	5 0.50 5.4 0 1.25 12.2
MATH	65.50	4.63	MATHSOFT McAFEE Associates (H)	6.6	3 0.13 1.9 0 -4.50 -7.0
MENT	22.88	10.88	MENTOR GRAPHICS MICRO FOCUS	13.8	1 -0.13 -0.9
MGXI	18.63	9.19	MICROGRAFX INC.	11.9	4 0.31 2.7
MSFT	42.13	23.38	MICROSOFT CORP.  ORACLE CORP.	124.3 38.8	1 -0.06 -0.1 6 -1.13 -2.8
PARQ	49.50	25.38	PARAMETRIC TECHNOLOGY PARCPLACE SYSTEMS INC.	46.8	8 2.50 5.6 5 ·0.13 ·2.6
PSFT PTEC	79.00	32.38	PEOPLESOFT PHOENIX TECHNOLOGIES	77.2	5 0.50 0.7
PSQL	14.63	3.13	PLATINUM SOFTWARE	9.6	3 -0.13 -1.3
PRGS		12.13	PLATINUM TECHNOLOGY PROGRESS SOFTWARE CORP. RAINBOW TECHNOLOGIES INC.	10.8 14.5	0 1.13 8.4
	25.50	14.63	RAINBOW TECHNOLOGIES INC.	17.6	3 -0.50 -2.8
RNBC	27.30				

Ехсн	52,Wee	k RANGE		Aug 224	for Name 1	Alv Des
					HANGE (	HANGE
REDB ROSS SAPE SCOC SDTI SKEY SPCO SQAX SOTA SSW	61.00 8.13 58.25 12.13 109.00 51.75 5.13 39.75 19.75	18.25 2.19 29.25 5.50 18.50 13.38 1.38 16.00 8.25 40.00	RED BRICK SYSTEMS INC. ROSS SYSTEMS SAPIENT CORP. SCO INC. SCURTY DYNAMICS TECH. SOFTWARE PUBLISHING CORP. (L) SQA INC. STATE OF THE ART STREILING SOFTWARE INC.	16.13 1.56 23.00 14.50	0.00 0.50 -2.25 -0.19 0.38 -1.50 -0.38 2.00 -2.50 -0.88	0.0 9.1 -5.0 -2.7 0.6 -8.5 19.4 9.5 14.7 -1.2
SDRC SYBS SYMC SNPS	81.38 37.38 39.75 33.25 46.75	14.50 15.38 8.75 23.00	STRUCT. DYNAMICS RESEARCH SYBASE INC. SYMANTEC CORP. SYNOPSYS SYSTEM SOFTWARE ASSOC.	21.00	3.75 -2.06 -0.25 0.50	21.7 -11.5 -2.3 1.3 -5.2
SSAX SYSF TRUV VIEW VMRK	30.63 30.38 10.13 17.50 19.25	8.25 4.38 4.38 9.63 5.75	TRUEVISION CORP. (L) VIEWLOGIC SYSTEMS	27.75 4.94 13.50 8.50	-0.50 1.75 0.06 -0.56 -0.63	6.7 1.3 -4.0 -6.8
WALK WALL WANG	12.75 27.00 26.13	6.25 13.00 14.50	WALKER INTERACTIVE SYSTEMS WALL DATA INC. (H) WANG LABORATORIES INC.	11.13 27.00 18.13	0.13 2.50 -0.13	1.1 10.2 -0.7
Inter	met	TO SEC	DEALESS AND RESIDEN	100	OFF 3.	43%
AMER BBN	71.00 48.75	24.50 15.63	AMERICA ON-LINE BBN CORP.	31.50 18.63	-0.38 -1.25	-1.2
CSRV	35.50 55.75 29.25	10.75 16.25 5.75	COMPUSERVE CORP. EDIFY CORP.	12.13	-2.38	-16.4
LCOS NETC	91.50	16.00	LYCOS INC. NETCOM ON-LINE	18.25	0.00	0.0
NSCP OMKT PSIX	87.00 42.25 29.00	22.88 13.75 6.75	NETSCAPE COMM, CORP. OPEN MARKET INC. PSINET	37.75 14.13 10.75	-1.69 -2.38 -0.75	-4.3 -14.4 -6.5
QDEK	39.50 39.25	5.63	QUARTERDECK CORP. RAPTOR SYSTEMS (L)	8.00	-0.38	-4.5 3.9
SCUR SPYG YHOO	64.50 61.00 43.00	12.00 12.00 15.50	SECURE COMPUTING CORP. (L) SPYGLASS INC. YAHOO! INC.	16.75 14.50 15.63 19.88	1.25 0.38 0.75	9.4 2.5 3.9
Sam	konduc	15.50	TANGO: INC.	17.88	UP 0	
AMD	36.00	10.25	ADVANCED MICRO DEVICES	12.75	-0.50	-3.8
ADI CHPS CRUS	30.13 15.88 61.13	17.00 7.88 12.63	ANALOG DEVICES INC. CHIPS AND TECHNOLOGIES CIRRUS LOGIC	24.25 11.00 16.13	2.25 0.88 -1.00	10.2 8.6 -5.8
CY	61.13 27.38 49.75	9.13 12.50	CYPRESS SEMICONDUCTOR CORP.	16.13 11.50 14.63	0.00	0.0
INTC LSI LSCC	83.25 62.50	49.81 17.00	INTEL CORP. LSI LOGIC CORP.	82.00	0.38	0.5 1.1 4.1
MCRL MU	42.50 32.50 94.75	19.75 12.00 16.63	LATTICE SEMICONDUCTOR MICREL SEMICONDUCTOR INC. MICRON TECHNOLOGY	28.75 17.75 23.63	1.13 0.00 -0.63	4.1 0.0 -2.6
MOT	82.50 33.63	44.75 13.00	MOTOROLA INC. NATIONAL SEMICONDUCTOR	55.13 15.50	0.88	1.6
TXN VLSI WDC	83.75 39.13 36.00	40.50 10.38 14.38	VLSI TECHNOLOGY	47.13 13.63	0.38 -0.25 2.88	0.8
			WESTERN DIGITAL CORP. (H)			8.7
XLNX ZLG	55.50 48.00	23.25	XILINX ZILOG INC.	36.00 37.00 26.50	-0.88 0.50	·2.3
XLNX ZLG	55.50 48.00	23.25 20.00	ZILOG INC.	37.00	-0.88 0.50	1.9
ZLG Peri	55.50 48.00 prierats 17.50	23.25 20.00 and Sub 7.88	Zilog Inc.  Systems  AMERICAN POWER CONVERSION	37.00 26.50	-0.88 0.50 UP a 0.19	·2.3 1.9 84%
APCC ADPT CBEX CGN	55.50 48.00 prierats 17.50 61.50 12.88 7.25	23.25 20.00 and Sub 7.88 35.00 3.00 3.38	Zilog Inc.  Systems  American Power Conversion Adaptec Inc. Camber Corp. (L) Cognitronics Corp.	12.69 50.38 3.44 3.81	0.50 UP a 0.19 0.38 -0.31 0.25	1.5 0.8 8.3 7.0
APCC ADPT CBEX CGN CREAF RACE	55.50 48.00 pherats 17.50 61.50 12.88 7.25 14.13 10.75	23.25 20.00 and Sub 7.88 35.00 3.00 3.38 3.50 3.63	ZILOG INC.  SYSLENS  AMERICAN POWER CONVERSION ADAPTEC INC. CAMBEE CORP. (L) COGNITRONICS CORP. CREATIVE TECHNOLOGY LTD.	37.00 26.50 12.69 50.38 3.44 3.81 3.94	0.50 UP a 0.19 0.38 -0.31 0.25 0.06	-2.3 1.9 84% 1.5 0.8 -8.3 7.0 1.6 5.9
Peri APCC ADPT CBEX CGN CREAF RACE DTM EMC	55.50 48.00 pherats 17.50 61.50 12.88 7.25 14.13 10.75 9.38 23.38	7.88 35.00 3.00 3.38 3.50 3.63 4.13 13.00	Zilog Inc.  Systems  American Power Conversion Adaptic Inc. Camber Corp. (() Cognitionics Corp. Creative Technology Ltd. Data Race Inc. Data Race Inc. Data Race Engl. EMC Corp.	12.69 50.38 3.44 3.81 3.94 6.75 7.13	-0.88 0.50 UP a 0.19 0.38 -0.31 0.25 0.06 0.38 0.25 0.38	-2.3 1.9 84% 1.5 0.8 -8.3 7.0 1.6 5.9 3.6 1.9
APCC ADPT CBEX CGN CREAF RACE DTM EMC EMLX ESCC EXBT	55.50 48.00 17.50 61.50 12.88 7.25 14.13 10.75 9.38 23.38 27.38 29.00	7.88 35.00 3.00 3.38 3.50 3.63 4.13 13.00 6.38 16.50	ZILOG INC.  SYSTEMS  AMERICAN POWER CONVERSION  AMERICAN POWER CONVERSION  CAMBER CORP. (1)  COGNITRONICS CORP.  CREATIVE TECHNOLOGY LTO.  DATA RACE (INC.)  EMIC CORP.  EVANS AND SUTHERLAND  EVANS AND SUTHERLAND  EVANS AND SUTHERLAND	37,00 26,50 12,69 50,38 3,44 3,81 4,6,75 7,13 19,63 13,50 23,25 13,25	-0.88 0.50 UP 2 0.19 0.38 -0.31 0.25 0.06 0.38 0.25 0.38 0.25 0.38 0.25	2.3 1.9 84% 1.5 0.8 8.3 7.0 1.6 5.9 3.6 1.9 1.9 0.8
APCC ADPT CBEX CGN CREAF RACE DTM EMC EMLX ESCC EXBLT IISLF IOMG	55.50 48.00 17.50 61.50 12.88 7.25 14.13 10.75 9.38 23.38 27.38 29.00 22.75 4.13 55.13	7.88 35.00 3.00 3.00 3.38 3.50 3.63 4.13 13.00 6.38 16.50 10.00 1.50	ZILOG INC.  23 SILORIS.  AMERICAN POWER CONVERSION ADAPTIC INC. CAMERIC CORP. (1) COGNITIONICS CORP. CREATIVE TECHNOLOGY-I.TD. DATA RACE INC. EMILES CORP. EMILES	12.69 50.38 3.44 3.81 3.94 6.75 7.13 19.63 13.50 23.25 13.25 1.69	0.19 0.38 0.31 0.25 0.06 0.38 0.25 0.38 0.25 0.19 0.06 -0.13 0.38	-2.3 1.9 84% 1.5 0.8 -8.3 7.0 1.6 5.9 3.6 1.9 1.9 0.8 0.5 -6.9 2.4
APCC ADPT CBEX CGN EMC EMC EXBT IISLF IOMG IPLS KMAG	55.50 48.00 17.50 61.50 12.88 7.25 14.13 10.75 9.38 23.38 27.38 29.00 22.75 4.13 55.13 8.25	7.88 35.00 3.00 3.38 3.50 3.63 4.13 13.00 6.38 16.50 10.00 1.50 2.75	ZILOGINC.  ZYSEUNE AMERICAN POWER CONVERSION ADAPTIC INC. CAMBER CORP. (1) COGNITIONICS CORP. COMPTICONICS CORP. DATARAM CORP. EMILER CORP. EMILER CORP. EMILER CORP. INTELLIGENT INFO. SYSTEMS - JOMEGA CORP.	12.69 50.38 3.44 3.81 19.63 13.50 23.25 13.55 13.55 23.25 13.55 23.25 23.25 23.25	0.50 UP 2 0.19 0.38 -0.31 0.25 0.06 0.38 0.25 0.38 0.25 0.19 0.06 -0.13 0.38 0.25 0.38	1.5 0.8 8.3 7.0 1.6 5.9 3.6 1.9 0.8 0.5 6.9 2.4 12.5 1.6
APCC ADPT CBEX CGN CREAF RACE DTM EMC EMLX ESCC EXBT IISLF IOMG IPLS	55.50 48.00 17.50 61.50 12.88 7.25 14.13 10.75 9.38 27.38 27.38 29.00 22.75 4.13 55.13 55.13 55.23 37.50 22.25 34.75	23.25 20.00 7.88 35.00 3.00 3.38 3.50 4.13 13.00 6.38 16.50 10.00 1.50 2.75 1.88 17.63 11.25	ZILOGINC.  23 SIBLES  AMERICAN POWER CONVERSION ADAPTIC INC. CAMERIC ORP. (1) COGNITIONICS CORP. CRATIVE TECHNOLOGY-I.TO. DATA RACE INC. EMILES CORP. PENS AND SUTHERLAND EXASTE OMICA CORP. IPL SYSTEMS INC. MICRO TOUCH SYSTEMS INC.	12.69 50.38 3.44 3.94 6.75 7.13 19.63 13.50 23.25 1.69 15.75 2.25 23.25 25 25 25 25 25 25 25 25 25 25 25 25 2	0.88 0.50 0.19 0.38 0.25 0.06 0.38 0.25 0.19 0.06 -0.13 0.25 0.38 0.25 0.19 0.06 -0.13	1.5 0.8 8.3 7.0 1.6 5.9 3.6 1.9 0.8 0.5 6.9 2.4 12.5 1.6 -1.8
APCC ADPT CBEX CREAF RACE DTM EMC EXBT IISLF IOMG IPLS KMAG MTSI PEAK PNCL AQM ONTM	55.50 48.00 17.50 61.50 12.88 7.25 14.13 10.75 9.38 23.38 27.38 29.00 22.75 4.13 55.13 8.25 37.50 22.25 34.75 19.75 6.75 28.50	23.25 20.00 7.88 35.00 3.00 3.38 3.50 3.63 4.63 10.00 1.50 2.75 1.88 17.63 11.25 4.88 3.25	ZILOG INC.  23 SINERS  AMERICAN POWER CONVERSION ADAPTIC INC. CAMERIC CORP. (1) COGNITIZONICS CORP. CRATIVE TECHNOLOGY/I.D. DATA RACE INC. EMILES CORP. EMILES CORP. EMILES CORP. EMILES CORP. EMILES CORP. EMILES CORP. INTELLIGENT INTO. SYSTEMS INTELLIGENT INTO. SYSTEMS INTELLIGENT INTO. SYSTEMS INTELLIGENT INTO. CONTRACTOR INC. MICRO TOUCH SYSTEMS INC. MICRO TOUCH SYSTEMS INC. MICRO TOUCH SYSTEMS INC. MICRO TOUCH SYSTEMS INC. PRAIR TECHNOLOGY GROUP PRINACE MICRO INC. QUANTUM CORP.	37.00 26.50 12.69 50.38 3.44 3.81 3.94 6.75 7.13 19.63 13.50 23.25 13.25 23.25 13.75 21.25 23.25 13.75 21.25 23.25 13.75 21.25 23.25 13.25	-0.88 0.50 UP 2 0.19 0.38 -0.31 0.25 0.06 -0.13 0.25 0.19 0.06 -0.13 0.25 0.19 0.06 -0.13 0.25 0.38 0.25 0.19 0.06 -0.13 0.38 0.25 0.19 0.06 -0.13 0.38 0.25 0.19 0.06 -0.13 0.38 0.25 0.38 0.25 0.19 0.06 -0.13 0.38 0.25 0.38 0.25 0.19 0.38 0.25 0.19 0.38 0.25 0.38 0.3	2.3 1.9 1.5 0.8 8.3 7.0 1.6 5.9 3.6 1.9 0.8 0.5 6.9 2.4 12.5 1.6 1.8 -7.6 5.7 -2.2
APCC ADPT CBEX CGN CREAF RACE DTM EMC EXBT IISLF IISLF IN INFERENCE ADMINISTRATION ON THE ROUS SEG	55.50 48.00 17.50 61.50 12.88 7.25 14.13 10.75 9.38 27.38 29.00 22.75 4.13 55.13 8.25 37.50 22.25 34.75 19.75 6.75 6.75 6.75 6.75 6.75	7.88 35.00 3.00 3.38 3.50 3.63 4.13 13.00 1.50 2.75 1.88 17.63 11.25 4.88 3.25 10.88 0.94 36.13	ZILOGINC.  AMERICAN POWER CONVERSION ADAPTIC INC. CAMERIC ORP. (1) COGNITIONICS CORP. CAMERIC ORP. (2) COGNITIONICS CORP. CAMERIC ORP. EMULER CORP. EMULER CORP. EMULER CORP. EMULER CORP. INTELLIGIST INTO. SYSTEMS INTELLIGIST INTO. SYSTEMS INTELLIGIST CONCESSION OF THE CONCESSION OF	37.00 26.50 12.69 50.38 3.44 3.81 3.94 6.75 7.13 19.63 13.50 23.25 13.25 13.25 13.25 13.25 23.25 13.75 22.55 23.25 13.75 23.25 13.25	0.88 0.50 0.19 0.38 -0.31 0.25 0.06 0.38 0.25 0.96 0.13 0.38 0.25 0.19 0.38 0.25 0.38 0.25 0.19 0.38 0.25 0.38	-2.3 1.9 84% 1.5 0.8 -8.3 7.0 0.6 1.9 1.9 0.8 0.5 -6.9 2.4 12.5 1.8 -7.6 6.9 2.2 10.2 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
APCC APPT CBEX CGN CREAK CGN CREAK CENCY CENCY CREAK CENCY C	55.50 48.00 17.50 61.50 12.88 7.25 14.13 10.75 9.38 27.38 27.38 29.00 22.75 4.13 35.13 8.25 37.50 22.25 37.50 22.25 4.13 8.25 4.13 8.25 4.13 8.25 4.13 8.25 8.25 8.25 8.25 8.25 8.25 8.25 8.25	23.25 20.00 3.88 35.00 3.63 4.13 13.00 6.38 16.50 10.00 1.50 2.75 1.88 17.63 11.25 17.25 18.88 19.94 36.13 10.94 36.17 10.94 1	ZALOG INC.  ZYSEUMS.  AMERICAN POWER CONVERSION ADAPTIC INC. CAMBER CORP. (1) COGNITIONICS CORP. COMPATIONICS CORP. DATARAM CORP. EMILER CORP. EMILE	37.00 26.50 12.69 50.38 3.44 3.81 13.94 6.75 7.13 19.63 13.50 23.25 13.2	0.88 0.50 0.19 0.38 0.25 0.36 0.38 0.25 0.38 0.25 0.38 0.25 0.38 0.25 0.19 0.06 0.13 0.25 0.19 0.10	-2.3 1.9 1.5 0.8 8.3 7.0 1.6 5.9 1.9 1.9 1.9 1.9 1.2.5 1.6 5.7 6.9 2.4 12.5 5.7 0.8 3.6 3.7 0.3 1.6 5.7 0.8 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0
APCC ADPT CBEX APCC GN CREAF RACE DISTRIBUTE CON CREAF RACE DISTRIBUTE COMMENCE CENTRAL COMMENTS OF CAME AND COMMENTS OF CAME CAME COMMENTS OF CAME CAME CAME CAME CAME CAME CAME CAME	55.50 48.00 17.50 61.50 12.88 7.25 14.13 10.75 9.38 27.38 29.00 22.75 4.13 55.13 8.25 37.50 22.25 34.75 19.75 6.75 6.75 67.75 44.13 8.75 67.75	23.25 20.00 7.88 35.00 3.30 3.00 3.38 3.50 4.13 13.00 10.00 1.50 2.75 1.88 17.63 11.25 4.88 3.25 17.25 4.88 3.25 17.25 4.88 3.25 17.25 10.88 10.94 10.88 10.94 10.88 10.94 10.	ZILOGINC.  ZILOGINC.  AMERICAN POWER CONVERSION ADAPTIC LINC. CAMERIA CORP. (1) COGNITIONICS CORP. CAMERIA CORP. (2) COGNITIONICS CORP. CARTICLE TECHNOLOGY LTD. CARRIAGE CORP. EMULES CORP	37,00 26,50 12,69 50,38 3,44 3,81 3,94 6,75 7,13 19,63 13,50 23,25 13,25 23,25 23,25 21,25	0.19 0.38 0.50 0.19 0.38 0.25 0.06 0.25 0.19 0.06 0.25 0.19 0.06 0.25 0.19 0.06 0.38 0.25 1.75 0.13 0.38 0.25 1.75 0.63 0.38 0.38 0.38 0.38 0.38 0.38 0.38 0.3	-2.3 1.9 1.5 0.8 8.3 7.0 1.6 5.9 3.6 1.9 0.8 0.5 9.2 4 12.5 -2.2 10.2 0.0 3.6 1.6 -1.8 -7.0 0.3 -1.6 -1.8 -7.0 0.3 -1.6 -1.8 -1.6 -1.8 -1.8 -1.8 -1.8 -1.8 -1.8 -1.8 -1.8
APCC CREAT APCC CREAT APCC CREAT APCT CREAT APCT CREAT APCT CREAT APCT CREAT APCC CREAT	55.50 48.00  Piterals. 17.50 12.88 10.75 12.88 10.75 14.13 10.75 14.13 10.75 14.13 10.75 14.13 10.75 14.13 10.75 14.13 10.75 14.13 10.75 14.13 10.75 14.13 10.75 14.13 10.75 14.13 10.75 16.18 16.75 1	23.25 20.00  and Sub 7.88 35.00 3.00 3.00 3.03 3.63 3.63 3.63 3.60 0.00 1.50 1.50 1.52 17.25 4.88 3.25 17.25 17.25 17.25 17.25 18.81 18.93 18.93 18.93 18.93	ZILOG INC.  23 SERIES  AMERICAN POWER CONVERSION ADAPTIC INC. CAMERIC CORP. (1) COGNITIZONIC SCORP. CRATIVE TECHNOLOGY ITD. DATA RACE INC. EMILER CORP. TEVANS AND SUTHERLAND EXAMSTER EMILER CORP. TEVANS AND SUTHERLAND EXAMSTER TEVANS AND SUTHERLAND EXAMSTER TEVANS AND SUTHERLAND EXAMSTER TEVANS AND SUTHERLAND EXAMSTER TO JULY SYSTEMS INC. KOMAG INC. MICRO TOUCH SYSTEMS INC. COMAG I	37.00 26.50 12.69 50.38 3.44 3.81 3.94 6.75 7.13 19.63 13.50 23.25 13.25 23.25 13.25 23.25	0.88 0.50 0.19 0.38 0.25 0.06 0.38 0.25 0.19 0.06 0.13 0.25 0.38 0.25 1.75 0.38 0.75	2.3 1.9 1.5 0.8 8.3 7.0 1.6 5.9 1.9 1.9 1.9 1.9 1.9 1.9 1.9 1.9 1.9 1
ALINX ZLG  PER APCT APCT APCT APCT APCT APCT APCT APCT	55.50 pherats 17.50 61.50 12.88 14.13 10.75 9.38 27.50 27.50 2	23.25 20.00 and Sub 7.88 35.00 3.00 3.00 3.00 3.00 3.03 3.50 6.38 13.00 1.50 1.50 1.50 1.7.25 4.88 4.32 17.25 10.88 4.36 11.25 29.75 39.88	ZILOG INC.  ZYSEUME  AMERICAN POWER CONVERSION  ADAPTIC INC.  CAMBER CORP. (1)  COGNITIONICS CORP.  COMPTONICS CORP.  DATA RACE INC.  EVANS AND SUTHERAND  EVANS STEEMAND  E	37,00 26.50 12.69 50,38 3.44 3.81 3.94 6.75 7.13 319,63 313,50 13,25 23,25 112,55 212,5 5.50 38,25 5.43 39,88 54,38 22,25 32,81 39,88 54,38	-0.88 0.50 UP 2. 0.19 0.38 -0.31 0.25 0.06 0.38 0.25 -0.13 0.25 -0.88 -0.8	-2.3 1.9 1.5 0.8 8.3 7.0 1.6 5.9 1.9 1.9 1.9 1.9 2.4 12.5 6.9 2.4 12.5 1.6 7.0 0.3 3.6 1.6 1.6 1.6 1.6 1.6 1.6 1.6 1.6 1.6 1
ZLINX ZLG PERIOD ADDT CBEX CGN CREAF RACE EMLX ESCC EXBT IISLF ION INTEL PEAK XMAG MTSI PEAK XRX AMLY AMLY ALD CATP CEN	55.50 61	23.25 20.00 20.00 20.00 20.00 3.00 3.00 3.00 3	ZILOG INC.  ZYSEUMS.  AMERICAN POWER CONVERSION ADAPTIC INC. CAMBER CORP. (1) COGNITIONICS CORP. COGNITIONICS CORP. DATA RACE INC. DATARAM CORP. EMILER CORP. EMI	37.00 26.50 12.69 50.38 3.44 3.811 19.63 115.79 115.79 123.25 22.25 32.20 38.25 12.30 38.2	-0.88	2.3 1.9 1.5 0.8 8.3 7.0 1.6 5.9 1.9 1.9 1.9 1.6 1.6 5.9 2.4 1.6 1.6 5.7 0.8 3.6 4.6 1.6 5.9 2.4 1.6 1.6 1.6 1.6 1.6 1.6 1.6 1.6 1.6 1.6
APCC APCC APCC APCC APCC APCC APCC APCC	55.50 61.50 61.50 61.50 61.50 61.50 61.50 61.50 61.50 61.50 9.38 29.90 21.38 29.90 22.73 8.25 37.50 6.75 6.75 6.75 6.75 6.75 6.75 6.18 8.55 6.75 6.18 8.75 6.18 8.75 6.18 8.75 6.18 8.75 6.18 8.75 6.18 8.75 6.18 8.75 6.18 8.75 6.18 8.75 6.18 8.75 6.18 8.75 6.75 6.75 6.75 6.75 6.75 6.75 6.75 6	23.25 20.00 27.88 35.00 3.83 35.00 3.83 3.60 3.60 3.50 3.63 3.65 3.65 3.65 3.65 3.65 3.65 3.65	ZILOG INC.  ZILOG INC.  AMERICAN POWER CONVERSION ADAPTIC INC. CAMERIC CORP. (1) COGNITIONICS CORP. CAMERIC CORP. (2) COGNITIONICS CORP. CAMERIC CORP. EMULES COR	37.00 26.50 12.69 50.38 3.44 3.811 19.63 115.75 22.25 13.75 2.25 13.75 2.25 2.25 37.00 38.25 12.25 27.00 38.25 2.25 37.00 38.25 2.25 37.00 38.25 2.25 27.00 38.25 2.25 27.00 38.25 2.25 27.00 38.25 2.25 27.00 28.25 28.	-0.88 0.25 0.06 0.38 0.25 0.06 0.38 0.25 0.19 0.66 0.38 0.25 0.19 0.66 0.38 0.25 0.19 0.66 0.38 0.25 0.19 0.38 0.25 0.19 0.38 0.25 0.19 0.38 0.25 0.25 0.25 0.38 0.25 0.25 0.25 0.25 0.25 0.25 0.25 0.25	-2.3 1.9 1.5 1.5 1.6 8.3 7.0 1.6 5.9 3.6 1.9 0.8 6.9 1.9 0.8 6.9 1.9 1.9 0.8 1.9 1.9 0.8 1.9 1.9 1.9 1.9 1.9 1.9 1.9 1.9 1.9 1.9
AMDY CENTRAL AND	55.50 55.50 61	23.25 20.00 27.88 35.00 3.88 35.00 3.86 38 36.00 1.50 2.75 4.88 36.12 2.75 39.88 36.50 36.63 36.	ZILOG INC.  ZYSENEN  AMERICAN POWER CONVERSION ADAPTIC INC. CAMBER CORP. (1) COGNITIONICS CORP. COMPUTE A CONVERSION ADAPTIC INC. CAMBER CORP. EMULES CORP. PLAYSTEMS INC. OMGA CORP. PLAYSTEMS INC. OMG INC. CORP. PLAYSTEMS INC. OMG INC. SEAGAITE EICHOLOGY GROUP PHINACLE MICRO INC. COMPUTER ANALYSTS INC. AMERICA CORP. AMERICAN MOMIT, SYSTEMS AMALYSTS INC. AUTO DATA PROCESSING COMPUTER TASK GROUP COMPUTER TASK GROUP  COMPUTER TASK GROUP  COMPUTER TASK GROUP  COMPUTER TASK GROUP  COMPUTER TASK GROUP  COMPUTER TASK GROUP  COMPUTER TASK GROUP  COMPUTER TASK GROUP  COMPUTER TASK GROUP  COMPUTER TASK GROUP  COMPUTER TASK GROUP  COMPUTER TASK GROUP	37.00 26.50 12.69 50.38 3.44 3.81 19.63 3.94 6.73 19.63 19.53 19.53 13.50 13.5	-0.88 0.50 0.19 0.25 0.06 0.25 0.06 0.25 0.06 0.38 0.25 0.06 0.38 0.25 0.06 0.38 0.25 0.06 0.38 0.25 0.06 0.19 0.06 0.13 0.25 0.38 0.25 0.25 0.38 0.25 0.25 0.38 0.25 0.25 0.25 0.25 0.25 0.25 0.25 0.25	1.5 0.8 8.3 1.5 0.8 8.3 7.0 1.6 5.9 3.6 1.9 1.9 1.9 1.9 1.9 1.9 1.9 1.9 1.9 1.9
XLNX ZLG  APCC ADPTI CBEX CGN RACE CREAR RACE EMLX ESCC	55.50 precase 17.50 61.50	23.25 20.00 and Sub 7.88 35.00 7.88 35.00 3.38 36.00 3.38 36.00 3.38 36.00 30.00 3.38 37.00 3.39 3.50 3.60 30 3.50 3.60 30 3.50 3.60 30 3.50 3.60 30 3.50 3.60 30 3.50 3.60 30 3.50 3.60 30 3.50 3.60 30 3.50 3.60 30 3.50 3.50 3.50 3.50 3.50 3.50 3.50	ZILOG INC.  ZYSENEN  AMERICAN POWER CONVERSION ADAPTIC INC. CAMBER CORP. (1) COGNITIONICS CORP. COMPUTE A CONVERSION ADAPTIC INC. CAMBER CORP. EMULES CORP. PLAYSTEMS INC. OMGA CORP. PLAYSTEMS INC. OMG INC. CORP. PLAYSTEMS INC. OMG INC. SEAGAITE EICHOLOGY GROUP PHINACLE MICRO INC. COMPUTER ANALYSTS INC. AMERICA CORP. AMERICAN MOMIT, SYSTEMS AMALYSTS INC. AUTO DATA PROCESSING COMPUTER TASK GROUP COMPUTER TASK GROUP  COMPUTER TASK GROUP  COMPUTER TASK GROUP  COMPUTER TASK GROUP  COMPUTER TASK GROUP  COMPUTER TASK GROUP  COMPUTER TASK GROUP  COMPUTER TASK GROUP  COMPUTER TASK GROUP  COMPUTER TASK GROUP  COMPUTER TASK GROUP  COMPUTER TASK GROUP	37.00 26.50 12.69 50.38 3.44 3.81 19.63 3.94 6.73 19.63 19.53 19.53 13.50 13.5	-0.88 -0.88 -0.88 -0.88 -0.88 -0.89 -0.89 -0.81 -0.90 -0.90 -0.81	1.9 1.9 1.5 0.8 8.3 7.0 1.6 5.9 1.9 1.9 1.9 1.9 1.9 1.9 1.9 1.9 1.9 1
APCC ADPT CBEX CGN CREAK RACE EMLX ESCL TEM NOTE OF THE CBEX TEM NOTE OF	55.50 precision 17.50 61.50 61.50 7.25 10.72	23.25 20.00   and Sub   7.88 35.00   3.38 35.00   3.38 35.00   3.38 36.33   3.60 36.33    3.60 36.30   3.60 36.30    3.60 36.30   3.60	ZILOGINC.  ZYSIEMS  AMERICAN POWER CONVERSION ADAPTIC LINC. CAMERIC CORP. (1) COGNITIONICS CORP. (2) COGNITIONICS CORP. (2) COGNITIONICS CORP. (2) COGNITIONICS CORP. (3) COGNITIONICS CORP. (4) COGNITIONICS CORP. (4) COMPLETE CORP. (5) COMPLETE CORP. (6) COMPLE	37.00 26.50 12.69 37.00 12.69 37.00 12.69 37.00 12.69 37.44 47.50 13.50 13.50 13.50 13.50 13.50 13.50 13.50 13.50 13.50 13.50 15.66 13.50 13.50 15.66 13.50 15.66 13.50 15.66 13.50 15.66 13.50 15.66 13.50 15.50 15.56 13.50 15.50 15.56 13.50 15.50	-0.88 -0.88 -0.88 -0.88 -0.88 -0.88 -0.89	-2.3 1.9 1.5 0.8 8.3 8.3 8.3 9.3 1.6 1.6 1.6 1.6 1.9 1.9 1.9 1.9 1.9 1.9 1.9 1.9 1.9 1.9
APCC ADPT CBEX CGN APCC CREAF RACE EMLX ESCL CREAF RACE RACE RACE RACE RACE RACE RACE RACE	55.50 press 55.50 61.	23.25 20.00 and Sub 7.88 35.00 3.30 3.30 3.30 3.30 3.30 3.30 3.30 3	ZILOG INC.  ZILOG INC.  AMERICAN POWER CONVERSION ADAPTIC INC. CAMERIC CORP. (1) COGNITIONICS CORP. CAMERIC CORP. (2) COGNITIONICS CORP. CAMERIC COMPUTER TASK GROUP MELISE.  MELISE COMPUTER TASK GROUP MELISE COMPUTER	37.00 26.50 12.69	0.88   0.89   0.19   0.30   0.19   0.38   0.25   0.25   0.25   0.25   0.25   0.25   0.38   0.39   0.39   0.39   0.39   0.30    0.30   0.30   0.30   0.30    0.30   0.30   0.30    0.30   0.30   0.30    0.30   0.30    0.30   0.30   0.30    0.30   0.30    0.30   0.30    0.30   0.30    0.30    0.30   0.30    0.30    0.30   0.30    0.30    0.30   0.30    0.30   0.30    0.30	-2.3 1.9 1.5 0.8 8.3 7.0 1.6 5.9 1.9 1.8 -2.6 5.7 -2.2 2.4 12.5 1.6 1.6 3.6 1.9 1.9 1.9 1.9 1.9 1.9 1.9 1.9 1.9 1.6 1.6 1.6 1.6 1.6 1.6 1.6 1.6 1.6 1.6
APCC ADPT CEN CATP CE	55.50 piterals. 17.50 piterals	23.25 20.00 and Sub 22.00 20.00 and Sub 27.28 35.00 35.00 35.00 35.00 36.38 3.50 4.13 35.00 6.38 3.50 6.30 6.30 6.30 6.30 6.30 6.30 6.30	ZALOG INC.  ZALOG INC.  AMERICAN POWER CONVERSION ADAPTIC INC. CAMERIC CORP. (1) COGNITIONICS CORP. (2) COGNITIONICS CORP. (3) COGNITIONICS CORP. EMULES CORP. EM	37,00 26.50 12.69 12.69 12.69 12.69 12.69 12.69 12.69 12.69 12.69 13.44 13.94	0.88 UP 2 0.19 0.19 0.38 0.06 0.06 0.38 0.25 0.38 0.25 0.19 0.25 0.38 0.25 0.19 0.25 0.38 0.25 0.39 0.39 0.39 0.39 0.39 0.39 0.39 0.39	-2.3 1.9 0.8 8.3 7.0 0.8 1.9 0.8 0.5 1.9 0.8 0.5 1.9 0.8 12.5 5.7 10.2 12.5 1.6 1.9 12.5 12.5 13.6 14.6 14.6 15.9 16.6 16.7 16.6 16.7 16.7 16.7 16.7 16.7
APCC ADPT CEN CATP CE	55.50 pherais. 17.50 pherais. 17.50 pherais. 17.50 pherais. 17.50 pherais. 17.50 pherais. 17.50 pherais. 17.55	23.25 20.00  and Sub  7.88 3.50 3.00 3.00 3.00 3.00 3.00 3.00 3.00	ZILOG INC.  YASHIMIA  AMERICAN POWER CONVERSION ADAPTIC INC. CAMBEL CORP. (1) COGNITIONICS CORP. DATARACH INC. EVANS. AND SUTHERAND EVANS STEEMAN INC. QUANTUM CORP. TEXTRONIC INC. QUANTUM CORP. TEXTRONIC INC. QUANTUM CORP. TEXTRONIC INC. STEEMAN INC. XERON CORP. TEXTRONIC INC. COMPUTES INC. CAMPUTES INC. CAMPUTES INC. CAMPUTES INC. STEEMAS GROUP INC. GOMPUTES INC. GENERAL INC. ECENTICAL COLOR INC. MERISEL ELECTRONIC DATA SYSTEMS INC. EGOHLAD DISCOUNT SOFTWARE ELECTRONIC DATA SYSTEMS CORP INACON CORP. INC. MERISEL ELECTRONIC DATA SYSTEMS CORP INACON CORP. REVIOLDS AND REVIOLDS EVENDLES AND REVIOLDS EVENDLES AND REVIOLDS INC. MERISEL ELECTRONIC DATA SYSTEMS SOR	77.00 12.69 12.69 50.38 3.44 4.74 19.63 19.75 19.7	0.88 0.89 0.89 0.89 0.89 0.89 0.89 0.89	-2.3 1.9 0.8 8.3 7.0 0.8 1.9 0.8 0.5 0.9 0.8 0.9 0.8 12.5 5.7 0.9 12.5 1.6 1.9 1.6 1.6 1.9 1.6 1.6 1.9 1.6 1.6 1.6 1.6 1.6 1.6 1.6 1.6 1.6 1.6
APCC CAMPAINT AND	55.50 pierals. 17.50 pierals. 17.50 pierals. 17.50 pierals. 17.50 pierals. 17.50 pierals. 17.55	23.25 20.00  and Sub  7.88 35.00 3.00 3.00 3.00 3.00 3.00 3.00 3.00	ZILOG INC.  ZYSEUMS.  AMERICAN POWER CONVERSION ADAPTEC INC. CAMBER CORP. (1) COGNITIONICS CORP. COMPOSITIONICS CORP. DATARAM CORP. EMILER CORP. EMI	12.69 (26.50 (26	-0.88 -0.50   UP 20.50   UP 30.50   UP 30.50   O.19   O.38   O.25   O.66   O.38   O.25   O.66   O.38   O.25   O.66   O.88   O.75   O.88   O.89   O.99   O.	-2.3 1.9 0.8 8.3 7.0 0.8 8.3 7.0 9.2 9.2 9.2 9.2 1.9 1.9 9.2 1.9 1.9 1.9 1.9 1.9 1.9 1.9 1.9 1.9 1.9
APCC CABAX CREATER TO THE PROPERTY OF THE PROP	555.50  77.50  12.88  61.50  12.88  23.88  23.88  29.00  44.13  55.68  56.38  43.75  44.13  8.75  6.75  31.88  55.88  56.38  56.08	23.25 20.00  and Sub  7.88 35.00 3.00 3.00 3.00 3.00 3.00 3.00 3.00	ZALOG INC.  PASSERS  AMERICAN POWER CONVERSION ADAPTIC INC. CAMERIC CORP. (1) COGNITIONICS CORP. (2) COGNITIONICS CORP. (2) COGNITIONICS CORP. EMULES CORP. EMULE	12.69 (26.50 (26	-0.88 -0.138 -0.	1.5 0.8 4 8.3 7.0 6 9.2 4 6.3 3.1 6.5 7.4 9.3 3.6 4 1.6 1.6 1.6 1.6 1.6 1.6 1.6 1.6 1.6 1.6

EW ANNUAL HIGH REACHED IN PERIOD (L) = NEW ANNUAL LOW REACHED HT NORDBY INTERNATIONAL INC., BOULDER, COLORADO

COPTRICATION TO MORDEY INTERNATIONAL INC., BOULDER, COLORADO
THIS INFORMATION IS BASED ON SOURCES BELIEVED TO BE RELIABLE, AND WHILE EXTENSIVE EFFORTS ARE MADE TO ASSURE ITS ACCURACY, NO GUARANTEES CAN BE MAD
NORDBY INTERNATIONAL AND COMPUTERWORLD ASSUME NO LIABILITY FOR ANY INAC
CURACIES, FOR INFORMATION ON MORDBY SCUSTOMIZED FINANCIAL RESEARCH SER-

# **How to contact Computerworld editors**

CONTACTING US BY PHONE
All editors can be contacted at our main phone number, (508) 8790700, unless otherwise noted below. Our 24-hour news tip line is
(508) 820-8555, For subscriptions, call (800) 669-1002, back issues, call (508) 820-8129, perints, call (508) 820-8125,
Our main fax number is (508) 875-8931.

#### CONTACTING US BY E-MAIL

CONTACTING US BY E-MAIL
OUT Web address is www.computerworld.com. All of our staff
members can be reached via E-mail on the Internet using the form
insthame\_lastname@w.com. For example, News editor Patricia
Keefe is at patricia \_keefe@w.com. IDG News Service correspondents can be reached using the form firstname\_lastname@idg.com.
Subscription inquiries go to circulation@cw.com.
Letters to the editor are welcome and should be sent to letters@cw.com. Please include your address and telephone number.

CONTACTING US BY MAIL Our postal address is PO Box 9171, 500 Old Connecticut Path, Framingham, Mass. 01701

Respond to our Talkback inquiries at talkback@cw.com.

#### CONTACTING CW EDITORS

We invite our readers to call or write with comments and ideas. It is best to submit ideas to one of the department editors as well as to the appropriate beat reporter.

Paul Gillin (508) 620-7724 Maryfran Johnson (508) 820-8179

#### DEPARTMENT EDITORS/NEWS

News Editor Sections Editor stant News Editor int Sections Editor Online Editor ciate Editor, News

Patricia Keefe (508) 820-8183 Johanna Ambrosio (508) 820-8553 Neal Weinberg (508) 820-8177 Kevin Fogarty (508) 820-8246 Michael Fitzgerald (508) 820-8206 Mitch Betts (202) 347-6718

#### SENIOR EDITORS/NEWS

Cocal-area networks

Metwork management

Metwork management

Metwork management

Metwork management

Metwork management

Metwork management

Julia King (610) 532-7599 Kim S. Nash (214) 716 9822

#### SENIOR WRITERS/NEWS

#### STAFF WRITERS/NEWS

Stewart Deck (508) 820-8155 Kim Girard (508) 820-8223 Justin Hibbard (415) 548-5515 Juan Carlos Perez (508) 820-8567 Randy Weston (508) 628-4869 OPINIONS/VIEWPOINT

## DEPARTMENT EDITORS/FEATURES

vs/Buyer's Guide James Connolly (508) 820-8144

### SENIOR EDITORS/FEATURES

Alian E. Aliter (508) 520-7714
Steve Ulfelder (508) 620-7745
Tam Harbert (508) 820-8147
Joseph Maglitta (508) 820-8192
Robert L. Scheier (508) 628-4931
David B. Weldon (508) 820-8166
Cathleen Gagne (508) 620-7729

#### ASSOCIATE EDITORS/FEATURES

Bob Fink, senior research manager (508) 820-8116; Kevin Burden, senior researcher; Laura Hunt, research analyst; Amy Malloy, assistant researcher; Stefanie McCann, senior graphics coordinator; Mari Keefe, Fluegelman Inter

Etlen Fanning, managing editor (508) 820-8374; Roberta Fusaro, assistant managing editor, Christina Alcardi Maguire, senior copy editor, Kimberly Gillard, Michelle Grabon, senior production copy editors, Jamie Eckle, Pat Hyde, David Ramel, Jeremy Selwyn, copy editors; Monica Sambataro, online copy editors; Monica Sambataro, online copy editors

#### GRAPHIC DESIGN

om Monahan, design director (508) 820-8218; Janell Genovese, Mitchell J. Jayes, Nancy Kowal, senior graphic designers; David Waugh, Mary Beth We tephanie Werskey, graphic designers; Rich Tennant, John Klossner,

#### ADMINISTRATIVE SUPPORT

Linda Gorgone, office manager (ext. 8176); Connie Brown (ext. 8178), Lorraine Witzell (ext. 8139); Rita Jones (ext. 8172), editorial assistants; Chris Flanagan, West Coast editorial assistant, (415) 548-5563.

#### COMPUTERWORLD MAGAZINES GROUP

(Includes Premier soo, Campus Edition, Best Places to Work, Leadership Se-ries, Intranet Series, Clent/Sever-Journal, Electronic Commerce journal and vertical industry journals.)

Alan Alper, editor (5:08) 820-815; Mary Frandel, executive editor: Anne McCroy, Catherine McCroyer, Jovec Putchian-Ferranil, managing editors; Kimberlee A. Smith, assistant managing editor and online coordinator; Stephanie Eauder, and time to:

# IDG NEWS SERVICE CORRESPONDENTS

Paris bureau chief Paris correspondent Munich correspondent UK correspondent Tokyo correspondent

Marc Ferranti (33) 1-4904-8001 |eanette Borzo (33) 1-4904-7917 Torsten Busse (49) 89-811-6057 Ron Condon (44) 181-460-0944 Rob Guth (81) 33-358-6122 Terho Ulmonen (88) 62-500-6523

# Companies in this issue

Page number refers to page on which story begins. Company names can also be searched at www.computerworld.com.

3Com Corp	115
A. C. Nielsen Co	. 69
Aberdeen	
Group, Inc	,105
	- 59
Adlife Marketing and	
Communications	10
Advanced Micro Devices, Inc	1
Amdahl Corp	16
American Airlines	. 28
America II Group, Inc	1
American Management	
Systems, Inc.	1
American National	
Standards Institute	. 32
Ameritech Cellular Services	- 57
AMI Leasing Group, Inc	. 49
Andersen Consulting	90
ANS	63
Apple Computer, Inc	8,14
49,54	,117
Arbor Software Corp	69
Arlen Communications, Inc	90
Avantel Avery Dennison Corp	57
Avery Dennison Corp	50
B. F. Goodrich Co	
Bank of America	., 69
Baxter Healthcare Corp	1
Bay Networks, Inc.	59
Bayer Corp	74
BBN Planet	
Bechtel Group, Inc.	1
Belcan Engineering	44
Bell Atlantic Co Bell Atlantic Nynex Mobile	90
Bell Atlantic Nynex Mobile	57
BellSouth Corp Berlow Real Estate, Inc	54
Berlow Real Estate, Inc	50
<b>Bloomberg Financial Markets</b>	44
Boole & Babbage, Inc	58
Borland International, Inc	54
Brainstorm Technology, Inc.	54
Bristol-Myers Squibb Co	74
Bristol-Myers Squibb	
Pharmaceutical Group	
Business Objects, Inc	8
Cabletron Systems, Inc	88
Campbell Soup Co	28
Certified Computer	
Services, Inc.	12

Charles Schwab & Co 58
Chevron Information
echnology Co1
echnology Co1 Cheyenne Software, Inc 44
Ligna Dental Health 44
IMI Corp 57,63
isco Systems, Inc 115
NA Insurance Co 49
Cognitech Corp12
Cognos, Inc 8
Comcast Cable
Communications, Inc 90
Compag Computer Corp 41,49
Computer Associates International, Inc
nternational. Inc 6
Computer Science Corp 8,73
Computer Security Institute 74
Continental Cablevision, Inc 90
Data General Corp 44,49
Data General Corp AA.A9
Dataquest
Davidson Consulting 2
Decisys, Inc
Deloitte & Touche74
Detroit Edison Co 74
Dialogic Corp 50
Digital Equipment Corp., 49,54,88
Digital Pathways, Inc 69,118
Ekco Group, Inc69
Entergy Services, Inc
ESRI, Inc 50
F.I.T., Inc
First Albany Research1
Forrester Research, Inc 8,12
16,63,81,105
Frontier Software Development, Inc 59
Development, Inc 59
Frve Computer Systems, Inc, 88
Funk Software, Inc 88
GammaLink 50
Gartner Group, Inc
58,65,69,81
Gateway 2000, Inc41
Georgia Instituto
of Technology10
Giga Information
Georgia instance of Technology
Gigabit Ethernet Alliance 57
-

9	Global Knowledge
	Network, Inc 74
ò	Global Village
5	Communication, Inc 50
	Goldman, Sachs & Co
۱	Grupo Financiero
	Banamex Accival 57
	GTE Corp10
	GTE Mobilnet, Inc 57
	Herman Miller, Inc 85
	Hewlett-PackardCo 48.40
	59,65,81,88,90
	Hormel Foods Corp 28
	Hurwitz Group, Inc88
	HydraWeb Technologies, Inc 65
	Hydro Agri North America 8,73
	IBM 6,8,16,28,44,49,54
	58,69,73,81,88,117
	IBM Consulting Group 73
	ICL49
	ICL
	Infolmage, Inc 54
	Infonetics Research, Inc1
	Information Builders, Inc 8
	Information Management
	Systems, Inc
	Informix Corp12
	Informix Software, Inc 8
	Input, Inc
	Institute of Electrical and
	Electronics Engineers, Inc 32
	Intel Corp 16,44,49,81,88
	Intermountain Health Care 85
	International
	Business Systems 6
	International Data Corp 6,8,12
	14,15,16,28,49,54,81
	Interpact
	Intuit, Inc
	Iona Technologies Ltd 54
	Jack Morton Products 8
	JBA International 6
	Jetform Corp 8
	Jones, Day, Reavis & Pogue1
	KRON
	Legato Systems, Inc 44
	Lexis-Nexis16
	Logicon Communication
	Technology Inc. 1

Folia istalia savillas palik 02
Lotus Development Corp 32,54
LTV Steel Corp 74
Mapco, Inc 85
MapInfo Corp 50
Maxm Systems Corp 58
McAfee Associates, Inc 50,81,88
MCI Communications Corp 57
Meta Group, Inc 54,65,69,88
Microsoft Corp1,8,12,14,15,16
32,44,49,50,69,81,88,105,117
Mid-Atlantic Oracle
Users Group 32
Motorola, Inc 44,90
MTV12
NASA1
Nat Systems, Inc 28
National Board
of Medical Examiners12
National Institute of Standards
and Technology 20,32
NationsBank Corp 58
Net Guru Technologies, Inc 63
Netcom On-line Communications
Services, Inc 63
Netcraft Ltd 117
NetGravity, Inc65
NetOps Corp1
Netscape Communications
Corp1,6,12,16,20
32,54,59,105,117
NetTech, Inc
Network General Corp 59
New South Wales State
Rail Authority59
Next Software, Inc 50
Norand Corp 57
Nordstrom, Inc
Norsk Hydro A/S
Northeast Utilities, Inc 57
Novadigm, Inc 88 Novell, Inc 12,32,44
Novell, Inc
Object Management Group 54
Olivetti USA
Olympus Image
Systems, Inc 48
OnDemand Software, Inc 88
Open Environment Corp 54

ong Island Savings Bank 6s

Open Group
R. R. Donnelley & Sons 115 Sabre Travel Information
Sabre Iraves information Network 73 Sagent Technology, Inc 93 SAP AG 87, 73 SCO, Inc 444, 48 Seasjas Software, Inc 44, 48 Seasjas Software, Inc 44, 48 Seasjas Software, Inc 49, 49 Seasjas Software, Inc 49 ShowCase Corp 59
49,50,54,717   Sybase, Inc.   12,32,56   Symantec Corp.   81,88   Tally Systems Corp.   88   TASC, Inc.   33   TeleChoice, Inc.   90   TeleCommunications

Teubner & Associates, Inc..

he Continuum Co	73
he Data Warehousing	-
nstitute	7.4
he Mitre Corp	28
he Standish Group	
nternational, Inc 6,9	54
he X Consortium	50
ivoli Systems, Inc 58,8	38
rancell Systems, Inc	59
urner Broadcasting Sales, Inc.	38
wo Crows Corp	12
J.S. Chamber	
of Commerce	63
J.S. Department of Commerce	32
J.S. Department of Defense	1
J.S. Department	
of Justice 20,1	
Unisys Corp 44,49.	
University of Georgia 1	17
University of	
Southern California	63
University of West Virginia 1	115
USA Group, Inc UUNet Technologies, Inc	74
UUNet Technologies, Inc	63
Viacom, Inc	
Viasoft, Inc.	73
Wal-Mart Stores, Inc	74
Washington Mutual Bank	
Welborn Clinic	88
Wells Fargo & Co	58
Wells Fargo Bank	69
Wharton School of Business	
Wilcoxon Construction Co	
X/Open SQL Access Group	
Xephon	
Yankee Group, Inc.	5
Yellow Cab Cooperative, Inc	5

INTRODUCING CONFIGURABLE NETWORK COMPUTING.

A SOFTWARE TECHNOLOGY.
SO TRANSPARENT,
YOU CAN SEE THE FUTURE
THROUGH IT.

Protect your mission-critical software investment from the inevitable technology and business changes of tomorrow with Configurable Network Computing," or CNC. Available only in J.D. Edwards OneWorld" software, CNC's distributed object technology is flexible enough to partition and redistribute your applications across current and emerging industry standards, without the time-consuming programming required by traditional client/server systems. Today, OneWorld with CNC works with UNIX, Windows NT, OS/400 and MVS systems, plus the leading SQL databases. And tomorrow, who knows? Best of all, it's from J.D. Edwards, a leader in enterprise solutions, with almost 4,000 customers in over 90 countries. For a free white paper, call 1-800-727-5333. Or visit www.idedwards.com

**JDEdwards** 

SOFTWARE FOR A CHANGING WORLD

# Rmon

CONTINUED FROM PAGE 1

But fully implementing Rmon to track performance trends can help administrators spot emerging problems before they impact vital business applications.

"Vendors whine that end users call Rmon an absolute necessity in their proposals, but six months to a year later, those buy-

Top priority

More than half of the

252 corporate buyers

surveyed by Business

Research Group in

Newton, Mass, cited

the importance of hishs

and other gear having

embedded Rmon.

ers have never turned it on to collect and correlate the information it can provide," said Tim Wilson, management analyst at Decisys, Inc., a network consultancy in Sterling, Va.

Rmon shipments should double this year to \$744 million, even though

usage appears to remain light, said Brian Burba, an analyst at International Data Corp. in Framingham, Mass.

"Rmon is becoming a checkoff item, a standard function like
support for the Simple Network
Management Protocol," Burba
said. "But there's a lot of 'dark
Rmon' out there that just hasn't
been implemented." One reason
is the complexity of instrumenting an entire network, he said.

Performance is another concern. "Rmon comes at a price in CPU cycles and memory," said Barry Stanton, a software engineer at Advanced Micro Devices, Inc. in Sunnyvale, Calif.

Stanton said he prefers to use stand-alone Rmon probes to track critical segments rather than embedded modules. So do

administrators at Chevron Information Technology Co. in San Ramon, Calif. Turning on Rmon can slow some internetworking gear, which then slows the flow of business traffic, they said.

Even worse, "Rmon can get turned off just when you need it most — as utilization gets high," said Darrell Epps, communications engineer at Chevron. That is because Rmon is a low-priority process when embedded in some hubs, he said.

A third factor is the majority of organizations lack "enough network gurus to go around," Howard said.

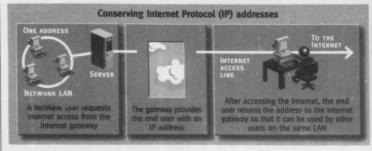
At Baxter Healthcare Corp. in Deerfield, Ill., some hubs contain Rmon, "but we haven't turned it on because there's no-

body available on staff to watch the reports," said Steve Tindall, project manager for LANs and infrastructure.

Like protocol analyzers, many Rmon tools sit unused until they are needed for troubleshooting, said Lou Steinberg, president of NetOps Corp., a network consultancy in New Fairfield, Conn.

"Users won't leave Rmon turned on to track network performance until it gets better integrated with their daily network management tools." he said.

It took an overhaul, but America II Group, Inc. in St. Petersburg, Fla., now tracks traffic fulltime. "Rmon isn't just an autopsy
tool," said Chief Information
Officer Michael Mullicane. "It
can help take control over your
network."



# Cisco, 3Com improve 'net links

By Bob Wallace

The tidal wave of companies and remote users seeking Internet access is forcing hub and router vendors to deliver offerings that improve links to the Internet.

3Com Corp. and Cisco Systems, Inc. will announce this week products that ease Internet access and conserve a limited resource — Internet Protocol (IP) addresses.

With 3Com's OfficeConnect Internet Gateway, information systems managers can let 50 users on a Novell, Inc. IPX NetWare LAN share one IP address. And it converts IPX traffic to IP, so NetWare users don't need \$100 to \$200 IP software on their PCs.

This eliminates the waste of addresses on infrequent Internet users, and it shields the NetWare server from hackers.

"It'd work very well for our small offices, which have Net-Ware LANs, though most of the rest of the company is using IP" explained Bill Rochell, corporate networking strategist at R. R. Donnelley & Sons, a major printing firm based in Chicago. Jeff Fritz, a telecommunications engineer at the University of West Virginia in Morgantown, agreed. "Anytime you can run fewer protocol stacks on a PC, you save money, memory and processor power," he said. "IPX-to-IP gateway products like this will be very popular with IPX shops."

#### Cisco's actions

For its part, sources say, Cisco will announce this week an IP address conservation and administration capability called Dynamic Host Control Protocol (DHCP) for at least one of its Internet products.

Before DHCP, network administrators manually assigned a permanent IP address to every user. Now administrators can deploy DHCP to manage a pool of available IP addresses — akin to a fleet of rental cars — and automatically lease the addresses to end users as needed.

Once a wide-area network transmission is complete, DHCP automatically frees up the IP address for the next user.

And 3Com this week will be-

come the first major internetworking vendor to avoid steep perminute Integrated Services Digital Network (ISDN) usage charges by using channels only when they are really needed.

Today, devices at both ends of an ISDN line can't communicate with each other intelligently, and as a result, often call up more B channels than are actually needed.

This capability, called Bandwidth Allocation Control Protocol, will be supported in 3Com's next software upgrade for its ISDN routers and in remote access servers, which are available now.

"This capability is an absolute requirement for us because it's too costly [with today's schemes] to keep multiple B channels up long," said Duane Rochelle, an information technology engineer in the network design and telecommunications group at Entergy Services, Inc., a Gretna, La., power company.

Beware of Internet service providers that focus on consumers. See page 63.

# NT workstations

**CONTINUED FROM PAGE 1** 

analyst at Technology Business Research, Inc. in Hampton, N.H.

These new systems cost about \$5,000, which is less than half the cost of a comparable Unix-based system.

But Garden warns that the new workstations have limits. Unix boxes still offer far more applications than Windows NT systems, especially in the high-end technical and engineering arena. For example, there still aren't enough applications to support power users who run multiple programs.

And Pentium Pro systems can't match the computational horsepower of some systems from Sun Microsystems, Inc. or Silicon Graphics, Inc. "NT boxes are going to be a real legion of doom for low-end [Unix workstation] systems," said James Greene, an analyst at Summit Strategies, Inc. in Boston. "But no one is going to be using NT to do their geographic imaging explorations."

But some shops are starting to bite. "With the kinds of capabilities these systems have, it is almost as if they are giving them away," said Gary Davis, president of Animation House, Inc. in Evansville, Ind.

Animation House, a heavy technical workstation shop, recently bought a Pentium Pro-based system for \$5,000 from Gateway 2000, Inc. Davis estimates the system would have cost him more than four times as much from a Unix vendor. He uses the system for digital video and imaging applications.

"It is becoming pretty evident that these boxes are capable of handling resource-intensive applications that used to require a higher-end workstation previously," said Eric Singleton, director of information systems at AlliedSignal Technical Service Corp. in Columbia, Md. As a result, when it comes time for them to upgrade their engineering workstations, they "will consider looking at these new offerings," he said.

## Follow the leader

HP is the first major vendor to formally announce a Pentium Pro personal workstation with these kinds of graphics capabilities, but several other vendors are expected to follow suit before year's end. Digital Equipment Corp., for instance, is prepping an early September release, and desktop leader Compaq Computer Corp. recently formed a separate workstation division. Compaq is expected to announce products in the fourth quarter.

What is really going to set these systems apart from other Intel-based workstations is the relatively sophisticated graphics capabilities they support, analysts said. HP, for instance, is porting its HP Visualize Unix workstation graphics technology to Windows NT, while Digital is porting its PowerStorm graphics to NT. Others, such as Compaq, are forming alliances with workstation vendors to do the same thing.

As a result, these "NT-based workstations clearly can do the job for a lot of the engineering design work out there," said Rich Partridge, an analyst at D. H. Brown Associates, Inc. in Port Chester, N.Y.

Senior editor Bob Francis contributed to

Periodical postage and at Transingham, Mass., and additional mailing affilies. Posted under Canadian International Publication agreement 6/35/697, Computerworld (555) cross-agical plant publication agreement 6/35/697, Computerworld (555) cross-agical plant publication agreement 6/35/697, Computerworld (55) cross-agical plant publication agreement 6/35/697, Computerworld (55) cross-agical plant publication agreement 6/35/697, Computerworld (55) cross-agical plant publication (55) cross-agical p









WHEN THE DUST SETTLES, THERE'S ONLY ONE WINNER.







The Micron Millennia™ line of computers offers extra-high performance multimedia computing and was recently recognized with two more PC Magazine Editors' Choice® awards. With 512KB pipeline cache and 4MB of EDO RAM with MPEG and 3D support on the video card, you have the speed and power to run your favorite applications with optimum performance.

- Intel 166MHz Pentium® processor
- 512KB pipeline burst cache, flash BIOS
- 8X EIDE CD-ROM drive, 3.5 floppy drive
- 16-bit stereo sound & speakers
- PCI 64-bit 3D video, MPEG, 4MB EDO
- · Tool-free minitower or desktop
- · Microsoft<sup>®</sup> Mouse, 104-key keyboard
- · Microsoft Windows® 95 & MS® Plus! CD
- ∮ 5-year/3-year Micron Power<sup>SM</sup> warranty
- 16MB EDO RAM 1.2GB EIDE hard drive
- 15" Micron 15FGx, .28dp (13.7" display)
- · Microsoft Works 95 CD
- 32MB EDO RAM 2.1GB EIDE hard drive • 15" Micron 15FGx, .28dp (13.7" display)
- · Microsoft Office Pro 95 & Bookshelf® 95 CDs
- 64MB EDO RAM 3.1GB EIDE hard drive
- 17" Micron 17FGx, .26dp (15.8" display)
- . Microsoft Office Pro 95 & Bookshelf 95 CDs
- With 133MHz Pentium processor . . . . . . . . subtract '200





# ennia P200 Plus

- Intel 200MHz Pentium processor
- 512KB pipeline burst cache, flash BIOS
- PCI 32-bit Ultra SCSI Fast-20 controller
- . 8X SCSI CD-ROM drive, 3.5 floppy drive
- 16-bit stereo sound & speakers
- PCI 64-bit 3D video, MPEG, 4MB EDO
- · Tool-free minitower or desktop
- · Microsoft Mouse, 104-key keyboard
- Microsoft Windows 95 & MS Plus! CD
- # 5-year/3-year Micron Power warranty
  - 16MB EDO RAM 1GB Fast SCSI-2 hard drive
  - 15" Micron 15FGx, .28dp (13.7" display)
  - Microsoft Works 95 CD
  - 32MB EDO RAM 2GB Fast SCSI-2 hard drive
  - 15" Micron 15FGx, .28dp (13.7" display)
  - Microsoft Office Pro 95 & Bookshelf 95 CDs
  - 64MB EDO RAM 4GB Fast SCS1-2 hard drive
  - 17" Micron 17FGx, .26dp (15.8" display) · Microsoft Office Pro 95 & Bookshelf 95 CDs
  - With 166MHz Pentium processor . . . . . . subtract 5100

International Sales International Fax 208-893-8970 208-893-7393







900 E. Karcher Rood, Nempa, ID 83687 = Mon-Fri 6am-10pm Sat 7am-5pm (MT) International Soles Hours: Mon-Fri 6am-7pm (MT) = 208-893-3434 = Fax 208-893-3424 Purchase Order Fax 208-893-8992 = Schmickal Support Ancialella 24 Hours A Day –7 Days A Week Technical Support E-mail: techsupport.meik@micron.com

of Micron Electronics. Inc. All rights reserved. Micron Electronics is not responsible for omissions and/or errors in hypotypethy. All provisions are subject to subsidiary Prices and superficience may be changed without notice, prices on for include ship interfaces. 30-dity recopies by being designed using the district prices of our include ship and the complexity of the prices and prices are laboration. As a substitute of the ship and the prices are substituted to the ship and the prices are laborated to the ship and t

800-362-1204

http://www.mei.micron.com



# David Coursey

# Hey, Microsoft: Can you spare a few execs?

f Microsoft really wants to help Apple, I've got an idea.

You may have heard that Microsoft has been secretly running a group in San Jose, Calif. It has hired people to build Macintosh Internet software and handed money to small developers who are willing to do the same. Microsoft's goal is reportedly to build Apple's market share, partly because if Apple doesn't survive, Microsoft could fall under the watchful gaze of the U.S. Department of Justice. Besides, Microsoft still has a nice business selling Office for the Macintosh.

But if Microsoft is really serious about helping Apple, I know how to accomplish it: Send them Steve Ballmer. As Microsoft's executive vice president of sales and support and all-around No. 2, Ballmer is just the person to turn Apple around. Ballmer is the gold standard of enthusiasm, could sell Macintoshes to even the most devoted Windows shop and is generally regarded as the sharpest marketer in the industry.

Of course, he'd have to replace CEO

Gilbert F. Amelio and Chief Technology Officer Ellen Hancock — Apple's dynamic duo of cluelessness — but their tenure is probably limited anyway.

Marco Landi, who was recently named Apple chief operating officer, is a keeper, though. He's bright, says the right things and seems to understand the business challenges, if not the product challenges, Apple faces.

To get the Apple product organization in line, another loaner executive is required. Microsoft Group Vice President

Nathan Myhrvold, who runs the applications and content organization, ought to be able to bring some spark to Apple's beleaguered R&D campus. Myhrvold is at least as smart as Bill

Gates on technical matters, although he isn't the allarounder Gates has become.

I know the idea of Microsoft executives taking over Apple sounds crazy, but Apple isn't capable of saving itself anymore. And when outsiders try to help, Apple

is so huge and disorganized that no one seems able to act. Amelio's record so far consists of doing things any breathing person would do when confronted with Apple's problems. Nothing more, nothing less. Hancock is an executive most closely associated with the bad old days at IBM, hardly the reassurance the Apple community needs.

It sounds funny that Microsoft would want to save Apple, given the history of acrimony between the two companies. But the battling was mostly Apple vs.

Microsoft. It was Apple's holier-thanthou culture and the fact that Microsoft has always made truckloads of money selling Macintosh software and Macintosh-like software for the PC.

This isn't the first time Microsoft has tried to help Apple. Microsoft Group Vice President Pete Higgins says he and Bill Gates tried to persuade Apple to license the Mac OS many years ago, but then-CEO John Sculley and his technical chief, Jean-Louis Gas-

see, wanted no part of it.

So, yes, my proposal is a bit radical. And although some people will raise legal questions, keeping Apple alive is in Microsoft's best interest — and ours.

Coursey is an industry analyst, consultant and editor in chief of "coursey.com," an online newsletter that covers personal computing, the Internet and communications. Got a gripe or an idea? Write him at david@ coursey.com

## Charles Babcock

# One year later, what was the fuss?

t was a year ago that Windows 95 was launched, and one wonders at this point what all the hoopla was about. Desktop operating systems had been rendered a sec-

Desktop operating systems had been rendered a secondary technology by the time Windows 95 appeared, even if few of us recognized it at the time. The Internet was well on its way to becoming a mass movement, but many of us joined a late-night watch for the first sightings of Windows 95 like the beholders of Halley's comet.

If Microsoft were staging a Windows 96 launch this week, would it buy the London Times for a day or pay \$12 million for the privilege of playing The Rolling Stones' "Start Me Up?" That's not what an Internet company does. Instead, it promises to supply regular upgrades as if each advance is a routine step instead of a giant leap forward. What a difference a year makes.

The emergence of the Internet and platform-neutral devices such as Net-scape's Navigator and Sun's Java neutralize the impact of the operating system. If IBM and Apple want to keep developing OS/2 and the Mac OS, they

will get their users on to the 'net just as effectively as Microsoft. If the network is the computer, all users become equally empowered once they gain access to the Internet. It makes another cultural event like the launch of Windows 95 seem impossible.

Speaking of empowerment, I've been impressed by the second chance that Apple is getting from the Internet, thanks to the popularity of the Macintosh with graphic artists and World Wide Web page authors.

But to sustain this second chance, Apple will have to move rapidly to improve

the transaction processing and database management capabilities of its operating system and hardware. In addition to generating content, Apple platforms serve as hosts for first-time Web pages. As traffic goes up and the number of

things being done on a site escalate, Apple-biased Web masters are likely to find they need to move to Windows NT or Unix.

Right now, I would say that Apple is getting bailed out by the popularity of the Macintosh as a content authoring system, and some-

where between 2% and 20% of the time it is supplying the server hardware, too.

Estimating just how widely the Mac and its clones are used on the 'net is risky. Researchers at the University of Georgia launched a survey of Web sites that found 20% run Apole hardware.

An outfit called Netcraft Ltd. in Bath, England, pings Internet servers with its Web crawler and tabulates the results. It gives Apple less than 2% of Web servers. I would peg the figure at 15% to 17%, counting many small, noncommercial sites. So what if Apple isn't the main carrier of electronic commerce? The Web has temporarily bailed out the company.

In the end, you have to ask whether Apple can sustain its present strong po-

sition. Do its clever, multimedia-oriented Macintoshes function adequately as Web servers? I don't think so, not on a high-transaction basis. Can its Workgroup Servers pick up the slack? I doubt they can fit into the corporate network well

enough to use legacy databases.

But no one anticipated Apple would reach such a position of strength. There's no need to attribute it to brilliant strategy or adroit Internet product development. With focus and innovation, however, Apple could convert its good luck into longer-term strength.

Babcock is Computerworld's technical editor. His Internet address is charles\_babcock@cw.com.



The following observations about Hollywood's depiction of computers are bouncing around the Internet (original author unknown):

Word processors never display a cursor. You never have to use a space bar when typing long sentences. All monitors display inch-high characters.



Government computers have either easy-to-understand graphical interfaces or incredibly powerful text shells that correctly understand and execute commands typed in plain English.

You can get any information you want by typing "access all of the secret files" on any keyboard. Likewise, you can infect any computer by typing "upload virus.

SCREENS

ARE SO

**BRIGHT THEY** 

PROJECT

THEMSELVES

ONTO THE

USER'S FACE

All computers are connected. You can access information on the villain's desktop computer even if it's turned off.

Powerful computers beep whenever you press a key or the screen changes. Really advanced systems also emulate the sound of a dot-matrix

All computer panels have thousands of volts and flash pots just beneath the surface. Malfunctions are indicated by a bright flash, a puff of smoke,

a shower of sparks and an explosion that forces the user backward.

Users typing away on a computer will turn it off without saving the data.

A hacker can get into the most sensitive computer in the world before intermission and guess the secret password in two tries.

Complex calculations and loading of huge amounts of data are accomplished in less than three seconds. Movie modems transmit data at the speed of 2G bit/sec.

No matter what kind of computer disk it is, it's readable by any system it's put into.

# Letter from Vegas

More than 700 self-described hackers, phreakers and crackers attended the Defcon IV annual computer hackers conference in Las Vegas last month. Attendance was up 55% from last

Who are these people? What do they want? For one thing, hackers are getting older. The average age of attendees was 27, up from 20 last year. Females comprised 8% of attendees, up from 1% last year.

Hacker motivations ran the gamut. Some crackers said they just love the challenge. Others were electronic pranksters who use a mouse like a spray-paint can, tagging systems to show their prowess. And then there were the Unabomber types who harbor darker resentments. One of the scarier T-shirt slogans: "Practical Unix Terrorist."

So what are their next targets? With a prejudice against anything that makes money for Bill Gates (referred to as The Evil One), hackers have begun serious work finding holes in Windows NT. Meanwhile, Java was called woefully insecure and "a good virus propagation mechanism '

The good news is that security experts say most hacking could be prevented if companies just used the security tools and techniques already available.

Submitted by Tommy Ward. Digital Pathways (www.digpath.com)



# Inside Lines

**Losing its religion...**Oracle plans to give Windows NT a big wet kiss at an NT-related intranet conference in San Francisco this week. Oracle hasn't exactly been ignoring Microsoft's rival to Unix; nearly 25% of last year's NT database sales went into Oracle's coffers, according to International Data Corp. But Oracle CEO Larry Ellison's propensity for Microsoft bashing made it politically incorrect to make much noise about NT at Oracle. No more, insiders said. Oracle this week will announce that it's putting Windows NT on the same development pedestal as Unix and creating a 150person sales unit devoted to NT. Plans for porting more of its products to NT will also be spelled out.

... and sleeping with the enemy

Oracle also is mulling the idea of getting into the data warehouse consulting business, including projects that would involve the R/3 software of applications rival SAP AG. Because of the rivalry and a lack of in-house R/3 expertise, a full jump into the SAP applications consulting market isn't in the cards any time soon, said one Oracle official. But data warehousing is a more likely scenario, even if R/3 is what will be warehoused.

## **Electronic tit for tat**

The battleground between Netscape and Microsoft now includes E-mail. First, Netscape vice president of engineering Rick Schell sent a message to Microsoft to complain that Netscape wasn't receiving timely information from Microsoft about its operating systems. Last week, Paul Maritz, a group vice president at Microsoft, wrote to Schell that Microsoft "provided a lot of help." Then Maritz accused Netscape of not supporting Microsoft in efforts to make products from the firms work together. And for good measure, Maritz added another three pages of accusations about Netscape products not being "open."

# Andersen to share the risk

For many users, the very mention of Andersen Consulting conjures up an image of legions of consultants who bill on a time-and-materials basis for work that somehow always seems to increase over the course of a project. Now Andersen wants to change that, especially when it involves SAP R/3 implementation projects. At this week's SAP user conference in Philadelphia, Andersen will announce what one source close to the firm called a "risksharing" pricing scheme. Under this scheme, consulting fees will be set up front. That way, users will know exactly what they're paying for. What a concept!

Unclogging the 'net

A Washington-based outfit called Delta Tech has unveiled software designed to reduce the size of large file transfers over the Internet. Update It compares original files with updated files and sends 'net users the difference.

Ascend plans product blast

Ascend Communications, a leading provider of remote access servers, has confirmed plans to announce its new high-end product, known as TNT in analyst circles, next week. TNT will be the first remote access server to support a 45M bit/sec. wide-area network line.

Last week, a New Jersey superintendent had to explain to the school board why officials paid a 16-year-old hacker \$875 to break in to its computer system. During the summer, some graduates needed transcripts for college applications. But no one from their high school was available to retrieve the records. So a computer coordinator recommended the teen, who was able to bypass the system's password protection. If you've had one of those days or heard a cool rumor, tell us abcut it. Contact Computerworld's news editor Patricia Keefe at patricia\_keefe@cw.com or at (508) 820-8183.



www.software.ibm.com/is/enterprise/ or call us at 1 800 IBM-2468, ext. GA220,

for an information pack. All questions answered.

Solutions for a small planet





OR

The NEC Versa 6000 Series

The NEC Versa 6000 Processor

133MHz Pentium Processor

POL and Cardbus Architecture

16MB RAM

16MB RAM

16MB RAM

5MB HAND DAVIDED TO DISPLAY
1,44GB HAND THE DISPLAY
1,21 1024 × 768 TFT DISPLAY
121 1024 × 768 TFT DISPLAY
122 NO DAVIDED TO THE DISPLAY
123 DAVID TO THE DISPLAY
101 101 Battery

VERSA 603U

NEO Vinsal Confu

ne art features, it may be the colo

way to truly maximize your productivity. Logally, that is,

ar 364, hear and feet the differ

Visit our new web site at http://www.nec.com

The resistation he

